Biodiversity Conservation & Economic Growth (BCEG) Project

Non-Timber Natural Resources and National Parks

-A Model for Economic Growth and Resource Conservation-

Prepared for:

Bulgaria Biodiversity Conservation and Economic Growth Project

The Project is a collaborative initiative between the

United States Agency for International Development

and the

Government of the Republic of Bulgaria

implemented by

Associates in Rural Development, Inc.

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Acronyms and Abbreviations

ARD	Associates in Rural Development, Inc.
BAHMC	Bulgarian Association of Herb and Mushroom Collectors
BAS	Bulgarian Academy of Sciences
BCEG	Biodiversity Conservation and Economic Growth Project
BSBCP	Bulgarian-Swiss Biodiversity Conservation Program
CCU	Central Cooperative Union
CITES	Convention on International Trade with Endangered Species
CoM	Council of Ministers
DCU	District Cooperative Union
EU	European Union
GDP	Gross Domestic Product
GEF	Global Environment Facility (note the acronym "GEF" is also generically in Bulgaria for the USAID/GEF Biodiversity project)
GIS	Geographic Information System
GoB	Government of Bulgaria
IFOAM	International Federation of Organic Agriculture Movements
IUCN	World Conservation Union
MBR	Maya Biosphere Reserve
MoAF	Ministry of Agriculture and Forests
MoEW	Ministry of Environment and Waters
MoU	Memorandum of Understanding
MPA	Medicinal Plant Act
MUZ	Multiple-Use Zone
NFB	National Forestry Board
NGO	Non-Governmental Organization
NNPS	National Nature Protection Service (of MoEW)
NP	National Park

NPD	National Park Department
NTNR	Non-Timber Natural Resources
PAA	Protected Areas Act
PMU	Project Management Unit
PS	Park Section
RDB	Red Data Book
RIEW	Regional Inspectorate of Environment and Waters
SME	Small and Medium Enterprises
USAID	United States Agency for International Development
USSR	Union of the Soviet Socialist Republics
VAT	Value-Added Tax (sales tax)

Preface

The Biodiversity Conservation and Economic Growth (BCEG) Project is funded by the United States Agency for International Development, (USAID), as part of its strategic support to the Republic of Bulgaria. The Project is sponsored by USAID in conjunction with the Government of Bulgaria – the Ministry of Environment and Waters (MoEW). The Project is governed by a Memorandum of Understanding (MoU) between the two governments, and its implementation covers the period: May 2000 – October 2002.

This Project is a logical evolution of earlier USAID assistance to biodiversity conservation in the country. It follows some 10 years of assessment, technical assistance and financing of Bulgaria's biodiversity conservation strategic development, new protected areas legislation, and new national park institutions. The Project is designed to capitalize on the achievements of the Bulgaria Global Environmental Facility (GEF) Biodiversity Project (implemented during the period June 1995-April 2000), and builds on lessons learned.

The BCEG Project addresses six specific contract themes known as tasks or "contract result packages". The BCEG Project includes the finalization and implementation of two national park management plans, and the development of a new management plan for Rila Monastery Nature Park. It assists in the development of financial mechanisms and strategies to ensure the solvency of national parks. The Project pilots economic growth activities with select target communities around two Bulgarian national parks. And it continues to build on the principles of strong public information and awareness as stepping stones for informed public engagement and promotion of biodiversity conservation and protected area management activities.

This Project is issued as a Task Order 01 (Contract Number LAG-I-00-99-00013-00) under the USAID Global Biodiversity and Forestry Indefinite Quantities Contract; and is implemented on behalf of USAID by Associates in Rural Development, (ARD) Inc., of Burlington, Vermont, USA.

The Project is implemented through a Project Management Unit (PMU) based in Sofia, and includes a Team Leader, three Bulgarian technical specialists, and support staff.

Project activities are coordinated through two mechanisms –

(a) Project Coordination Group – serves as a steering committee for Project planning and monitors implementation. This consists of the National Nature Protection Service of the MoEW, and national park directors, the PMU and USAID.
(b) Project Counterpart Team – PMU staff working with MoEW/NNPS counterparts.

The Project is largely implemented through the Directorates for Rila and Central Balkan National Parks. Additional technical assistance is provided by Bulgarian and international consultants, and is based on specific terms of reference.

Executive Summary

Throughout recorded history in Bulgaria there has been a strong connection between Bulgarians and nature. Nowhere is this more pronounced than in the traditional harvesting of non-timber natural resources. Because of its special location at an ecological and climactic cross-roads between major continental systems, Bulgaria is blessed with a wide variety of non-timber natural resources – a botanical diversity – that rivals both other temperate, as well as tropical, systems. Bulgaria maintains a long history of ethno-botany, reflected in its use of medicinal plants in traditional remedies and treatments, as well as in cuisine. Bulgaria presently ranks as the largest exporter of medicinal plants in Europe. Over the last five years the country has been ranked between 5th and 8th in the world in the export of wild resources. Annual exports of wild resources can be counted in the hundreds of millions of Bulgarian Leva.

So important are medicinal plants to the Bulgarian portfolio of natural resources that they are an important focus of the National Strategy for the Conservation of Biological Diversity (finalized in 1994 and adopted by the GoB in 1998). They are also the subject of specific legislation, the Medicinal Plants Act, of March 2000.

Bulgarian National Parks – Pirin, Rila, and Central Balkan – all harbor significant populations of medicinal plants – wild resources that can have both commercial and personal benefit. National protected area policy, as well as Park management plans, provide for continued access and sustainable harvest of non-timber natural resources in a controlled fashion. The sustainable harvesting, conservation and protection of these wild resources represents one of the biggest challenges to the management of National Parks – in part because of "inalienable" right of Bulgarians to collect these resources, and because of the conservation status of many of them.

Botanical biodiversity data, as well as socio-economic data collected during the preparation of Management Plans for Rila and Central Balkan National Parks (1997-99), gave some idea of the status and diversity of these resources within the Park territories. The data also gave some indication of the significance of these resources for subsistence use. These field inventories were published separately, and form a part of each Park's Geographic Information System (GIS).

Several wild resources have a more recent history of strong commercial interest in a restructured, market driven economy. They represent annual harvests that can be measured in the hundreds of tons. Approval of the 10-year management plans for Rila and Central Balkan National Parks in June of 2001, launched a pilot program dedicated to collaborative management of wild resources (non-timber natural resources). In order to design an effective set of activities, both National Park Directorates needed a better understanding of the supply chain dynamics of wild resource collection. This would allow them to identify economic growth opportunities for local communities that have a history of wild resource collection, as well as management responsibilities for these resources on their territory. This 3 volume compendium is the result of a summer of diagnosis and design activities conducted by the

staff of Rila and Central Balkan National Parks, target communities in pilot areas for each of the Parks, and the staff and consultants of the USAID-funded Biodiversity Conservation and Economic Growth (BCEG) Project between May and October 2001.

Situation Analysis

The analysis focused on two pilot areas – one for each Park – Klisura Park Section and four focal villages, for Central Balkan National Park; and Yakoruda/Belitsa Park Sections, Rila National Park, where rural communities are made up of many, small family settlements. Socio-economic and non-timber natural resource information collected from these areas are provided in this report, under Part 1. In addition, the analysis focused on one specific wild resource that forms an important contribution to both commercial and personal use patterns – V*accinium spp*. (blueberry varieties), as 70% of the total national distribution of these berries is found within the three National Parks.

There are five significant outcomes of the diagnosis section of this study.

1. While the importance of non-timber natural resources to local livelihood varies from area to area, and community to community around the two national parks, it is clear that the annual harvesting of wild resources is of exceptional importance to annual, family incomes – often representing between 30-80% of household incomes for the year. This is particularly true for ethnic minorities in areas of high unemployment. The importance of wild resources in annual income generation appears to be increasing in the face of economic restructuring and the vacuum created by the disappearance of state enterprises. This holds true for ethnic minorities, and increasingly for other Bulgarians.

2. The commercial value of wild resources collected from the national parks at the buyout (gate) point, far outstrips the annual, national subsidy given to National Parks from the national budget. Value is added to commodities at each point in their respective supply chains, so that wild resources represent a significant form of income and employment to the country. At present, the Government's strategy of using National Parks as effective resource conservation and land management tools is reaping rewards in terms of household income generation, far in excess of Government's investment in the Parks. This is even more important when you consider that income is being generated in rural communities with high levels of unemployment, and with GDPs lower than the national norm.

3. The wild resource, V*accinium spp*. (blueberries), represents a hardy and dependable wild resource with a long history of collection. There is no evidence of any significant threats to the viability or conservation of this resource. There is also no evidence of heavy metals in the samples taken from the pilot areas. Bulgarian blueberries are prized by the international blueberry market, and enjoy a well-developed export market. At the same time a well-developed industry leaves little or no opportunity to add any real value to wild blueberries at the local community level. Local attempts to add value would be hard-pressed to compete successfully with the regional and national, private, agro-processing and export markets. At the present time, small and medium enterprises (SMEs) do not appear a viable economic growth opportunity for local communities and economic growth.

4. Based on available information and trends accumulated through the public and private sector, we estimate, at present that Bulgaria's total production of blueberries *(Vaccinium spp*.) averages 700 tons per year. In addition, three to seven thousand (3000-7000) tons of mushrooms, 12 thousand (12,000) tons of herbs are collected, and approximately 300,000 individuals collect NTNRs in the country. We also estimate that up to eighty percent of Bulgaria's commercial blueberry harvest may come from national parks, 30 percent of mushrooms and raspberries, and a small percentage of all other herbs.

5. Loopholes in the national permitting system for medicinal plants, and inadequate coordination and monitoring between the authorities responsible for medicinal plant management of their respective territories, means that many wild resources are poorly managed, and their harvesting poorly regulated. While this is not a serious threat to hardy wild resources like the blueberries, it is a more significant problem when managing wild resources with a conservation value, or wild resources in the face commercial collection campaigns supporting "bio-prospecting" or meeting as yet unknown, international demand.

The results of this situation analysis are important in that they both inform National Park managers, as well as emphasize the role that Parks play in national economic development. The results should be used to inform policy on the conservation and sustainable management of wild resources, as well as to help National Park Directorates make important changes to management tools and approaches. In addition, these results should inform policy makers of the important role that national parks make to the national economy, and to illustrate the tenets of sustainable development. The results represent an effective advocacy tool for continued government subsidy of the protected area system.

The process used for information collection is also an important part of the evolving partnership being developed between National Parks and adjacent communities. At each and every step in this diagnosis process, local collectors, buyers, local government, and Park staff have been engaged in a dialog to discuss the merits and opportunities arising from a collaborative management approach to wild resources harvesting from within the Parks. This exchange of information has been vital to confirming assumptions, identifying non-timber natural resource collection issues, identifying prized resources areas, and building trust between management authorities and resource users. This approach is expected to yield results, if maintained, over the longer term. The reader will see the results of this in both Parts 1 and 2 of this report, where information is gathered in collaboration with local residents, and not just from them. The quality of information and the importance of this dialog confirms the longer-term approach of collaborative management of non-timber natural resources.

NTNR Program Design

The results of this work inform several elements of a non-timber natural resources collaborative management model for Bulgarian National Parks, and more broadly, Bulgarian protected areas. Using these results, and the growing confidence of Park Directorate staff, there is good reason to believe that the collaborative management "paradigm", can succeed – "Local Institutional Partnerships resulting in Resource Conservation with Sustainable Harvesting".

Important aspects of the model are ready for replication and further testing. Both the experience gained from local partnerships, as well as from resource assessment suggest that this model can be replicated for another season, for other Non-timber Natural Resources, and in other park sections. More specifically, we view the following as important to future activities:

1. Resource assessment methodologies and tools are easy to use, easily replicated, and should continue to incorporate local resources users in data collection and fieldwork. While specialist technical assistance is still necessary to supervise the resource assessment methodology, it is clear from this summer's resource assessment that rangers and local collectors can be valuable participants and contributors to the work. The results of this collaboration build trust, and mutual accountability.

2. Flaws in the permit system can be readily overcome. The existing permitting system is cumbersome, expensive, and provides for little control of resource collection quantities, location, or timing during a seasonal collection campaign. Part 3 of this Report provides several specific and clear recommendations for adjustments to the permit system that provide easier access for collectors, are easier to acquire, and are at minimal costs.

3. It is clear that some wild resources will continue to have strong commercial interests. *Vaccinium spp,* is a good example, to which mushrooms, rosehips, and other high mountain herbs can be added. Even though the Government dispensed with annual commercial permitting in 1999, we believe that longer-term commercial contracts are a viable tool for sustainable wild resource management. A commercial contract system must contribute to the overall health of the wild resource(s) AS WELL AS, the ecosystems in which they are found. Commercial contracts can be multi-year, bound by a performance bond, and awarded on a competitive basis. We submit that there is sufficient commercial interest in and dependency on specific resources, to develop a multi-year commercial contract with National Parks. Such contracts would be awarded not on price, but on proposals for business investments in local communities. ***Importantly, contracts would be awarded based on proposals for local investment and employment, AND individual collectors would continue to be given access to the Park.***

4. The resource assessment conducted in favor of *Vaccinium spp,* during summer 2001, is the basis for a longer-term monitoring program designed in support of "ADAPTIVE" management – a system of regular information collection that monitors management decisions, and whose periodic analysis is used to make changes in systems management as necessary. A wild resource, collector, and contractor monitoring system allows for virtually annual changes to be made in the permit and contracting systems as necessary. Since continued access and sustainable yields will remain a prime interest for local economies and for important, and select resources in the National Parks, the costs of operating and maintaining such a system are more than justified as part of each Park's annual operating subsidy.

Dedication

We would like to dedicate this report to the women and men of Bulgaria who represent a long tradition of NTNR collection and conservation. Their efforts and contributions to medicinal plant (NTNR) conservation are recognized in legislation, the most recent resource management efforts of the National Park Directorates, and the resource husbandry traditions observed by collectors and buyers. All these people are very aware of the challenges that NTNR resource management face. Most are already aware of the importance of sound and sustainable management. They appreciate how much this means to their livelihood, economic development, and conservation of these resources in Bulgaria.

Acknowledgements

Collaborative Management implies collaboration. Many people collaborated in the development and writing of these three studies. Importantly, they are the products of teams of Park staff, consultants, and BCEG Project technical staff. I wish to acknowledge them below:

Part 1 of the Situation Analysis for Non-timber Natural Resources and National Parks, is due in large part to the efforts of BCEG Project NTNR Consultant, Chavdar Gusev, and BCEG Pilot Program Specialist and staff person, Kamelia Georgieva.

Parks Section Head Philip Zaykov, and Specialist, Rumen Kolchagov, and their rangers contributed to the field work and interviews for communities and collectors in the pilot areas Yakoruda and Belitsa for Rila National Park. For Central Balkan National Park, the team was assisted by Park Section Head, Marin Kostov and Chief Expert in Flora, Gergana Staneva, and joined by the Klisura Park Section rangers for their fieldwork and interviews.

Part 2 – Vaccinium spp. Resources Assessment in the Pilot Areas, was compiled by Chavdar Gusev and edited by Dimitrina Boteva. This resource assessment of Vaccinium spp. for each pilot program area was compiled from the original assessment reports of Dr. Elena Genova and Dr. Antonina Vitkova for Central Balkan National Park pilot area; and Dr. Vladimir Valchev and Dimitrina Boteva, for Rila National Park pilot area. Dr. Nikolai Spassov contributed the review of information and report on wild animals dependence on Vaccinium plants in both National Parks. Park staff and community collectors joined the scientific teams during the assessment activities in the pilot areas.

Part 3 – Economic Growth and Management Options, is a summary of consultant reports supplied by Jared Hardner, BCEG Project, Enterprise Development and Financial Mechanisms Specialist. His contributions reflect the assistance of BCEG Project consultant Chavdar Gusev, and BCEG Project staff, Kamelia Georgieva. His activities and observations in the field were ably assisted by National Parks staff for Central Balkan and Rila.

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Organization of this Report

This is a compendium of three reports, largely conducted in sequence, between the months of June and October, 2001. Each report consists of its own summary and main body text; and each report (Parts 1-3) may be obtained separately.

Part 1 of the report is a **situation analysis of the two environments** – *a national environment* – focusing on legislation and a national industry, both operating with medicinal plants as their focus; and a *local environment* – one pilot area in each of Rila National Park, and Central Balkan National Park. The local environment is an in-depth assessment of non-timber natural resource collection from areas within the National Parks, and an analysis of the dependency of collectors from communities surrounding the National Parks on wild resources in these two pilot areas.

Part 2 of this report reflects a summary of the methodology and results collected from a NTNR resource assessment (that focused on *Vaccinium spp*. – blueberries) conducted by scientists, park staff, and local collectors. A resource (medicinal plant) assessment is a pre-requisite for a more detailed medicinal plant management plan. Two technical reports are available, and supply greater detail, supporting the methodology and results of this summary.

Part 3 reflects an analysis of economic growth and management opportunities open to National Parks for NTNR (medicinal plant) conservation and management. The report first reinforces the important subsidy, and income generation and distribution service provided by National Parks through their present management policy. The report then focuses on the economic and conservation management options open to National Parks if wild resource collection continues at both personal and commercial levels.

Each part of this report is supported by its own set of appendices. These sections are tabbed for your convenience and easy reference.

Non-Timber Natural Resources and National Parks

PART 1

Situation Analysis of the Status of NTNRs and Bulgarian National Parks - Opportunities for Collaborative Management

Summary

Bulgarian National Park management is carried out in accordance with the Protected Areas Act and is guided by implementation of ten-year ***Management Plans.*** In 2001, the country's first National Park management plans were approved for the Rila and Central Balkan National Parks. Both National Park management plans contain pilot programs for the collaborative management of non-timber natural resources. This program is also one of the foci of the Biodiversity Conservation and Economic Growth Project, sponsored by USAID. The purpose of the pilot program is to create a model for collaborative management of non-timber natural resources harvested from within the National Parks. Using particular criteria, two pilot areas were selected, one for each of the two National Parks. They are: Belitsa and Yakoruda Park Sections for Rila National Park, and Klisura Park Section for Central Balkan National Park. The model's development began with preliminary non-timber natural resources management planning as part of the development of the National Park Management Plans. The pilot program was launched in May of 2001, and is implemented through the Park Directorates for each Park. Blueberries, (*Vaccinium spp*.) were selected as the "focus resource" of the pilot program because significant populations are located within the country's three National Parks. They were also selected because of the presumed value they have to local livelihoods and national economic growth.

The first phase of the pilot program began with a situation analysis of the pilot areas. It includes collectors, buyers, and other supply chain players. The situation analysis was conducted by Park staff, BCEG Project consultants, and the BCEG Project team. It began with a systematic review of national policy, supporting legislation, and the national supply chain for non-timber natural resources in the country. It was augmented with a situation analysis conducted by Park staff in the two pilot areas in June 2001. This study is used to confirm the need for a strategy of collaborative management, and to examine the conditions and opportunities for successful non-timber natural resource management, and economic prosperity for communities bordering the Parks.

Bulgaria is land with *strong traditions in the us*e *of non-timber natural resources*. This analysis also contains a systematic review of an historical industry, and an important economic activity during the last century. It lays out the importance of the industry to the country over the last 70 years, and explains the changes that have take place in the face of economic reform.

There is still significant local knowledge about non-timber natural resource collection that focuses on commercial, subsistence, and medicinal collection of wild, non-timber resources. These include traditional collection of mushrooms, herbs and fruits. In addition, there is still a strong, traditional approach to resources collection that is fast disappearing in the face of commercial, market driven economies.

The collaborative management of non-timber natural resources is a Park management approach that acknowledges traditional and pressing livelihood needs dependent on wild resource harvesting. It aims to quality and quantify the needs of the people who are resource

collectors from around the Park and to stress their participation and role in sustainable wild resource use. This approach requires the identification of all interested parties, an understanding of their links with wild resource harvesting, and their inclusion in the evaluation of the resources. In addition, this approach acknowledges their role and responsibilities in wild resource management and protection, if continued harvesting is allowed.

The Medicinal Plants Act and the Protected Areas Act, both define fairly strictly and clearly the conditions and the rules for non-timber natural resources both outside and within the National Parks. This analysis describes the obligations and the responsibilities of the various institutions in fulfilling the requirements of the law.

This situation analysis examines both the national supply chain for commercially collected wild resources; it also examines the supply chain at local levels within each of the Parks pilot program areas. The analysis shows that both systems are well-developed, dynamic, and actually experiencing a period of consolidation after the markets opened up in the period 1993-95.

Collectors from the settlements in the pilot area are well-organized around the buyers and the brokers. Buyers and brokers have well established purchasing routines with value added at each step in a national supply chain aimed at export. Many local buyers are well versed in their profession, and had previously belonged to a national "guild" of NTNR buyers and processors.

In general, most of the wild resources collected in the country, and from the two Park pilot areas, have only the most basic value added to them. This includes basic processing, freezing or drying. Only small quantities reach a final product and are for consumption in the country. This is an issue of local markets for many producers. Over 80% of the natural wild resources, including the blueberries, leave the country as raw material.

From a point of view of **local livelihoods** and the role that wild resources play in the local economy, the non-timber natural resources have considerable importance. The situation analysis shows that for settlements within the pilot areas, the collection of non-timber natural resources are an important source of annual income for as much as 80% of the local household. Information collected suggests that the importance of wild resource collection to local livelihoods may actually be increasing in the face of growing unemployment and the restructuring of state owned enterprises. Dependence on wild resource collection may actually be increasing rather than decreasing since the official establishment of modern protected areas network in 1998. And while wild resources have always supplemented local household economies, it appears that more and more pressure could be put on wild resources that have a cash value on the open market.

Based upon the community partnerships being formed, and the information stemming from this situation analysis, both Park Management and the BCEG Project were able to more effectively focus activities reflected in **Part 2**, the *Vaccinium spp.* resource assessment, and **Part 3** - the selection of economic opportunities and management options.

The analysis of ***threats and the restrictions*** regarding the conservation and the sustainable management of non-timber natural resources shows that, under present trends and pressures, many of the issues associated with non-timber natural resources harvesting from National Parks can be dealt with through:

- improved resource management procedures;
- supplementary legislation (regulations);
- public education and awareness programs; and,
- continued law enforcement within Parks.

The BCEG Project and National Parks maintain that long-term conservation and sustainable management of these resources will be best developed based on strong partner relationships between the National Parks, local collectors, municipalities and the commercial sector. Only these partnerships appear to offer the opportunities for a set of checks and balances that favor long-term non-timber natural resources management, and sustainable harvesting.

Organization of Part 1

The first volume ***"Situation Analysis of the Status of NTNRs and Bulgarian National Parks – Opportunities for Collaborative Management"*** contains four sections.

Section 1 analyses the current legal and institutional framework in which the NTNR harvesting and trade happens. It also describes supply chain at the national level, and the major groups of players in it. The first section also includes a general picture of the NTNR economic value in the two National Parks – Rila and Central Balkan, based on existing information.

Section 2 of this report explains the rationale and logic for using a collaborative management approach for development of a model for management of NTNRs within each National Park. The model and steps employed in collaborative management are introduced as an opportunity for the future of the resources management in Bulgaria.

Section 3 contains concrete information gathered in a situation analysis of the two pilot areas of the two National Parks. These areas are the subject of the pilot program. Existing practices of management and harvesting of the NTNRs in the two pilot areas are described. This section includes a description of the importance of these resources to the social and economic aspects of livelihoods in the pilot areas, in addition to descriptions of local supply chains for products harvested from the wild.

Section 4 contains an analysis of the threats and constraints that need to be considered in the future models for NTNR management in the National Parks.

Introduction

i. Background

The collaborative management of the non-timber natural resources in the National Parks of Bulgaria is one of the possible approaches for the accomplishment of the Parks' management objectives. The Protected Areas Act defines two main functions of the National Parks in respect to the non-timber natural resources: their conservation on one hand and on the other – their management and use with the objective to provide livelihood of the local people who live close to the Parks' territories.

The management plans for Rila and Central Balkan National Parks, accepted and approved by the Council of Ministers, regulate the main directions of the work in respect to the management and the use of the non-timber natural resources. They outline the regimes and the standards for using these resources in accordance with the Parks' management units. The main management approach is the collaborative management, which means sharing not only the responsibilities and the obligations but also the benefits from the Park.

The Biodiversity Conservation and Economic Growth Project, funded by the USAID, is a logical step in the ten-year assistance of the U.S. Government for strengthening the management of the system of protected areas in Bulgaria. After the development of a national policy in this area, the Bulgarian Government commenced its implementation, and established and strengthened the institutions of the National Parks. These new institutions are currently implementing the country's first national park management plans.

The creation and testing of the operational models for conservation entrepreneurial initiatives is one of the areas of work of the ARD's team in Bulgaria which implements the project. Enterprise models are incorporated in the three years plans of the Park Directorates for the implementation of the management plans. These models will be tested through the development and the implementation of pilot projects. The pilot projects' objective (one for each Park) is to demonstrate the management goals based on join management of the non-timber natural resources in the Park territories.

Bulgaria is recognized for its historical use of wild natural resources, since the country has been a significant exporter of these resources. As the national protected areas system develops, and protected area management planning is used as a tool for land use and livelihood planning, it will be obvious that non-timber natural resources form a considerable share of the people's income and of the country's economy.

Using management plans to interpret policy, Park Directorates are realizing the need to structure information collection, and to quantify and qualify the use of non-timber natural resources. This is key to sustainable harvesting, and to perpetuation of both conservation and livelihood values.

ii. Brief History of the Use of Non-Timber Natural Resources in Bulgaria

The use of medicinal plants for treatment and prophylaxes was practiced in Bulgaria for centuries. In addition, Bulgarians have a long culinary and social tradition of herb gathering, processing and use. Ethno-botanical practices in Bulgaria are highly advanced; and many rural communities still have herbalists and homeopathic specialists who provide tonics and treatments for a host of medicinal problems. There is, in particular, a strong tradition of collection and use of medicinal plants practiced in rural mountain communities. This is notable, as large sections of Bulgaria's mountains, particularly alpine and sub-alpine habitats, are among Europe's richest in terms of medicinal plant biodiversity.

Unfortunately, there are few easily accessible records of the role that medicinal plants have played in the national and local economies prior to the 1900s. But it can be said with some certainty that medicinal plants have been an important commodity on national and regional markets for centuries.

Organized, large-scale commerce in non-timber natural resources and especially in medicinal plants, began after the First World War, due in large part, to the demand for such resources from Germany. The collection of medicinal plants became very intensive in the 1930s. Records show that in 1934 – 8,244 kg were exported and in 1939 – 721,000 kg, an 87 fold increase in exports. Most of this was used to support preparation of the German war effort.

Until 1947, organization of the collection, purchase, treatment and the supply of the medicinal plants was carried out by a small number of cooperatives and private companies. This system was reformed, along with other political and economic changes that occurred in 1944.

From 1947-1955, the Bulgarian state monopolized the cultivation, purchasing and processing of medicinal plants (medicinal plants, herbs, aromatic plants, wild fruits) under the National Pharmaceutical Division – Medicinal Plants Branch. In 1955, the exclusive rights to this industry were transferred to the Central Cooperative Union (CCU) and its subdivisions – local users' cooperatives, District Cooperative Unions (DCU) and a specialized state enterprise, called **Bilcoop.**

This commercial structure continued to function until 1989. After this time, the State monopoly on non-timber resources – medicinal plants, herbs and mushrooms - was discontinued. **Bilcoop**, however, continues to have a role in this commerce.

Bilcoop functioned in the organization, management and control of the overall activity for the collection of medicinal plants, herbs and mushrooms, as well as for the cultivation of mushrooms. Their main activities included:

- research regarding domestic and international demand;
- development of annual plans for the purchase of medicinal plants, herbs and mushrooms from recognized national collection areas;
- organization of the cultivation of medicinal plants; and,
- the production of sowing material.

A hierarchical, state-controlled supply system within the Central Cooperative Union provided the necessary organizational functions. At each level, the cooperative union operated and negotiated a system of prices and regulation. Each District (regional) cooperative union had its own central warehouses. These were used for storing, baling and packaging of the medicinal plants and herbs. Smaller units of the cooperative union carried out the purchase and the preliminary treatment in their purchasing stations. Collectors (individuals or collective groups) were responsible for resource harvesting.

Bulgarcoop, another State enterprise, exclusively managed the export activities of the CCU.

The **State Pharmaceutical Company** supplied the national pharmaceutical network.

At the height of the industry, the State Pharmaceutical Company and the CCU, dealt with 248 medicinal plants on a commercial scale. ***207 of these plants were collected from the wild***, and only 37 from cultivated sources. From these plants, 336 different products were produced.

More recent records reveal that the CCU dealt with 6,000-8,500 tons of herbs annually. During this same time (1980-1990) the two State companies handled, on average,183 different products annually. Morphologically they can be grouped as follows:

• roots	25
• root systems	6
• bulbs	1
• leaves	32
• stems	73
• blossoms	24
• fruit	13
• rind	7
• seeds	2

In addition to the CCU and State Pharmaceutical Company, there were other state departments dealing with commercial quantities of medicinal plants. These include the National Forest Committee and its national system of forest units, and a select group of pharmaceutical companies. State Forestry Units were organized and structured along similar lines to the CCU – a national network of local state enterprise units, engaged in the collection and preliminary processing of medicinal plants. These in turn were gathered in regional (district) centers, and then sold to the state, or exported through **Bulgarcoop**. Their volumes however, did not approximate the levels of the CCU and the State Pharmaceutical Company.

1. Non-Timber Natural Resources in the National Context

Non-timber natural resources in this report include plants and mushrooms that are used for medicinal, dietary, preventative, nutritional, and cosmetic purposes. According to the Bulgarian legislation these resources can be collected for both personal collection and commercial use.

The Medicinal Plants Act defines them as vascular plants that are used as herbs. The herbs are "separate morphological parts or whole plants, fruits or seeds, which are used fresh or dried, for medicinal and preventative purposes, as well as for the production of medicines, food and cosmetics." (This definition is legal, but deceptive, as the more traditional description suggests that herbs are restricted to seed plants without woody tissue that die to the ground at the end of each growing season. Since this is not the case for many of the fruit bearing plants, the misnomer of herb, interchangeably used with medicinal plants, refers to all types of annual and perennial plant parts that are considered to have personal and commercial collection value.)

Nationally economically valuable non-timber resources can be grouped into the following categories:

- Mushrooms - there are some *2,700* mushroom species known from Bulgaria. **200** of these, are edible. (Drumeva, Giosheva, 1995), about **39** species are used for commercial use. (Stamenov, Kolev, 1987);
- Medicinal plants – there are some *750* species of medicinal plants known from Bulgaria. **250** of these have economic value (Hardalova et.al., 1995);
- Wild Fruits – there are some *45 species* of wild fruits known from Bulgaria, of which **23** species are commercially used (Michev etc., 1983).

The sustainable use of the non-timber resources (medicinal plants) is a subject of national policy, and part of the country's National Strategy for Biological Diversity Conservation (1994). Sustainable management of medicinal plants is required by the Medicinal Plants Act (2000), and their collection should be based on objective scientific evaluation. This includes both qualitative and quantitative characteristics.

As a whole, both research and assessments of the medicinal plants and mushrooms are extremely insufficient. There is an absence of data on the population levels for many species – both those of nature conservation priority and of economic significance. There has been no national attempt to map these resources, nor has there been a systematic evaluation of the biological and economic productivity, linked to the national protected area system.

NTNR assessments are, however, one of the primary requirements in the law, and are required in all Protected Area Management Plans. Each plan must provide for the management and regulation of all non-timber natural resources. The basis for a medicinal plants management component is based on an evaluation of the commercial prospects, and the definition of nature conservation measures, a protected area zone scheme, and a definition of accompanying

regimes (what can or cannot occur in the zone); and norms, (quantitative definitions of these activities).

The collection of information for the biological and the economic productivity, the stocks of the resources, the distribution and the localities of the vulnerable (of conservation significance) and the economically significant species of both Parks, however, is in a preliminary stage.

1.1. Legal and Institutional Framework

The use and the protection of medicinal plants in the Republic of Bulgaria is regulated by policy (laws) and enacted through secondary legislation (orders and regulations). The Medicinal Plants Act, the Forests Act, and the Protected Areas Act are the most significant pieces of legislation governing these resources.

1.1.1. Laws and Regulations

Medicinal Plants Act

The Medicinal Plants Act (MPA) was passed by the National Assembly on 23.03.2000, and published in the State Gazette, issue 29, from 07.04 2000. The MPA regulates institutional roles and responsibilities related to significant, wild, renewable natural resources of the country – medicinal plants. The main purpose of the MPA is to provide conditions for the sustainable development of these resources. This has important implications for biological diversity in the country, and so, is an important supplement to biodiversity conservation policy and national strategy.

The main characteristics of the MPA:

1. Specifies the main principles of use so as ensures the protection of medicinal plants in their natural environment;
2. Regulates the main types of uses – for personal collection and commercial collection;
3. Makes provisions for the owners and the users of lands and forests to undertake measures for the protection and the restoration of populations and the habitats of medicinal plants;
4. Links their use to an assessment of the size and the state of the resources, so as not to decrease, damage or eliminate populations;
5. Specifies the need for evaluation, monitoring, and development of a national strategy and planning documents for the protection and the use of the medicinal plants. These must be linked to the forest management plans, municipal programs for environmental protection, and the management plans of the protected areas;
6. Identifies the general status of the protected medicinal plants in the country and compares those to international standards;
7. Provides for the development and use of “special regimes” regarding the use of medicinal plants where resources are limited. Includes a system for regulation and control on the collected quantities of herbs;

8. Regulates the responsibilities of the buyers who purchase fresh herbs – companies, processing plants, chemists' and others;
9. Introduces permits and fees for the collection of herbs for commercial purposes from state and municipal lands, and from within the forest fund. The permits are issued to individuals by the appropriate state authorities – state forestry units, municipalities, National Parks, and Nature Park Directorates, and district administrations.

The main approaches for the protection of the medicinal plants are outlined in the MPA. These include provisions for designating protected species under a special regime of use (prohibition of commercial use, limited quantities and areas), and site specific law enforcement for important territories.

Medicinal plant species whose populations are in a critical condition are protected under the Act. Their collection is only allowed for scientific purposes. There are 35 such medicinal plants in the country at present. Their designation is covered by Order No 718/1989 of the then Committee of Environment Protection (State Gazette issue 56/1989); RD - 401 and RD - 402 from1995 of the MoEW (State Gazette, issue 105/1995).

Special regimes of use are determined for medicinal plants with limited populations or limited capacity for reproduction. Commercial use must be strictly managed and controlled. Appropriate species and procedures are regulated by Orders No. No. RD 69/2001 and RD - 88/ 2001 of the MoEW. Twenty four (24) species are prohibited for commercial use in this manner. Special quotas, zoning and permits for export regulate the use of 11 species. The commercial collection of herbs under special regimes of protection is prohibited in the National Parks.

The **conditions and rules for the use of medicinal plants** in ***protected areas*** are regulated by the Protected Areas Act (State Gazette issue 133/1998). The use and the management of medicinal plant resources should be regulated by the **management plan** if provision within the zoning scheme allows for collection.

The use of the resources of medicinal plants in the National Parks must adhere to the following legal requirements:

1. Use of medicinal plants from the strict reserves is prohibited;
2. Interference in the biological diversity of medicinal plants, including the introduction of species that are not typical for the area, is prohibited;
3. The collection of rare, endemic, relict and protected medicinal plants is prohibited;
4. The collection of herbs and wild fruits should be regulated by the management plan with regimes and norms established as part of the Plan.

The MPA requires the development of a chapter **"Medicinal Plants"** in the management plan. It should include the following aspects:

1. Description of the habitats and the natural location of the medicinal plants, the habitat conditions and the quantity and quality of specific resources;
2. Analysis of the activities for the protection of the ecosystems, which include medicinal plants, and their sustainable use;
3. Priority measures for the protection and maintenance of diversity of the medicinal plants;
4. Description of areas and regulations affecting the management and sustainable use of the medicinal plants.

In accordance with above, Park Directorates are authorized to manage the use of the non-timber resources (medicinal plants). Each Park Directorate is empowered to publish instructions governing use, access, quantities and collection procedures. Directorates are empowered to design and set a permit system governing the same. Permits can apply to commercial quantities of non-timber natural resources. Permits are issued to individuals for a small administrative fee. All commercial quantities of medicinal plants must be accompanied by a permit. Permits can cover both medicinal plants and mushrooms.

Instructions issued by the Park Directorate should illustrate the main aspects related to management of the resource, the regulation and procedures for permits, as well as the mechanisms employed for protection and control.

Protected Areas Act

The Protected Areas Act (PAA) legislates the categories of protected areas, their purpose, regimes of protection and conservation, designation procedures, and regulates their management. The PAA aims to protect and conserve a national system of protected areas, thus ensuring Bulgarian national and natural heritage. The PAA provides for special regimes of protection, and indicates the general purpose for which protected areas are established. There is provision for six regimes of protected areas within the Law **– *Strict Reserve, National Park, Natural Site, Maintained Reserve, Nature Park, Protected Locality*** – Each respectively aims at the conservation of biodiversity using preservation of intact ecosystems and the natural processes in them. 4.65% of the territory of Bulgaria is embraced by this system, and regulated by this legislation.

The PAA prohibits the use of natural resources in the strict reserves. Collection of non-timber products (medicinal plants) from other areas of the National Parks, for commercial and personal purposes, is allowed in specific places and under certain conditions. Selective tree felling and grazing are also used as management tools. Access to the natural resources in other categories of protected areas - nature parks, protected sites and localities – is also regulated by secondary legislation, and orders tend to allow more liberal use.

The collection of relict, endemic and protected species is not allowed in any protected area.

The overall activities of any protected area are regulated by the management plans. In addition to setting the standards, regimes, conditions and activities on the territory, they must include provision for the use of non-timber natural resources and their quantities. These details are required in technical plans and management projects. On the basis of these projects and plans, the protected area authority can issue permits for commercial collection of herbs, mushrooms and wild fruits. They can also issue permits for pasture.

The Council of Ministers have approved a schedule of payment for the collection of fees for the use of the resources in the protected areas.

The management of protected areas is divided between institutions in Bulgaria, making coordinated actions and management difficult.

The MoEW manages and supervises all activities related to Strict Reserves, National Parks, Maintained Reserves, Natural Sites and Protected Localities. They accomplish this through a system of regional inspectors and Park Directorates. Authority for protection and management of select sites can be delegated to other authorities – local and regional. There are 15 Regional Inspector Offices (Inspectorates) and 3 National Park Directorates. These 18 offices are responsible to PAA enforcement throughout the country.

There are 11 Nature Parks in the country. They are managed by the Ministry of Agriculture and Forests. Each Park is managed by a Nature Park Directorate. Adherence to the law and management plans governing these Parks are audited and monitored by the Regional Environment Inspectorates/MoEW.

In most instances, National and Nature Parks contain strict nature reserves.

1.1.2. NTNR Management and Control Functions

Role and Responsibilities of MoEW/National Nature Protection Service (a Department of the Ministry)

The Ministry of Environment and Water manages and coordinates the development and enforcement of government policy for the protection and sustainable use of the medicinal plants, including its integration in the national sector policies. Thus the Ministry:

1. leads the development of the national strategy for medicinal plants and submits it to the Council of Ministers for review and approval;
2. coordinates the controlling functions of the institutions of the Government with respect to medicinal plants;
3. organizes the monitoring system for wild plants with respect to their state and use;
4. establishes and keeps a national registry (cadaster) for medicinal plants;
5. together with the Minister of Agriculture and Forests, gives their suggestions to the Council of Ministers for tariffs, user fees for medicinal plants in the forests, lands and water bodies that are state property;
6. defines the medicinal plants which fall under a special regime of use.

The Role of the Regional Environment Inspectorates

The Regional Inspectorates for the Environment and Water (RIEW) exercise administrative and control functions. They are regulatory bodies ensuring performance and compliance with biodiversity and environmental legislation.

In the case of NTNRs, the RIEW registers purchasing stations on their respective administrative territories. Registration must include copies of record books related to all medicinal plant supplies, as well as generalized information for purchased, processed and final quantities of NTNR products. Inventories must include all merchandising, as well as stocks in storage.

Each RIEW is expected to keep a cadastre of medicinal plants on the territory under their supervision.

Each RIEW distributes quotas for all medicinal plants registered within their administrative territory, subject to permitted quantities, and under special protection and regimes of use. The following procedures are to be carried out for this purpose:

> *Until December, 31, each year, people wishing to purchase medicinal plant quantities shall apply in writing using standard forms. Application forms typically included standard information, as well as previous histories of medicinal plant commerce and transaction. Any previous medicinal plant commerce subject to special regimes, must have a tax receipt, and this receipt must accompany the application*.
>
> *Specific quantities of medicinal plants (subject to special protection and/or regimes of use) are then assigned by committee, to an applicant. Allocations include amounts, specific harvest locations, and a timetable. The committee is comprised of bio-diversity experts from the Inspectorate, representatives of the protected areas, representatives of the regional directorates of forests, state forestry units , and relevant municipalities. The committee is supervised by the Director of the RIEW.*

RIEWs ensure compliance with the Medicinal Plants Section to municipal programs on environmental protection, and the Medicinal Plants Section to the forest management projects and programs through:

1. Enforcement of any special, pertinent regimes;
2. Business activities of Buyers of NTNRs at the purchasing stations and warehouses;
3. Determination of the kinds and quantities of herbs to be processed;
4. Conservation of habitats and medicinal plants;
5. Supervising people engaged in selecting medicinal plant genetic material and specifying the kind, quality, and methods of collection.

Role and Responsibilities of the National Park Directorate

The National Park Directorates, as regional bodies of the Ministry of Environment and Water, are responsible for the protection, management and the implementation of the management plans for the protected areas. In respect to non-timber natural resources, the Directorate must:

1 Organize the conservation, control of the resources use, and their reproduction on the Park territory;
2 Issue permits for non-timber resources collected from the Park territory;
3 Maintain a cadastre of medicinal plants on the Park territory.

Role and Responsibility of the Ministry of Agriculture and Forests

The Ministry of Agriculture and Forests (MoAF) is in control of the cultivation, selection and medicinal plants conservation. In addition, they are responsible for all sustainable use on the territory of the forestry unit. For this purpose MoAF:

- Develops a policy on medicinal plants conservation and their use outside settlements *(this will eventually be in accordance with the impending National Medicinal Plants Strategy)*;
- Manages and co-ordinates activities related to the medicinal plants cultivation by organizing the:
  - selection, introduction, testing, and trial records;
  - production and control of the sowing and planting materials;
  - development of environmentally friendly cultivation technologies;
  - maintenance of collections and seed banks;
  - activities related to the cultivation of medicinal plants;
  - export and import licenses for sowing and planting medicinal materials;
  - maintenance and reproduction of medicinal plants within lands – including forests and water bodies under their control.

The MoAF exercises control over sowing and planting material of medicinal plants.

The Director of the National Forestry Board (NFB) at the MoAF:

- Exercises control over the medicinal plants used and reproduced within forestry fund (state forest lands);
- Plans and organizes activities on conservation and protection of medicinal plants within the forestry fund;
- Provides the MoEW with information for monitoring and evaluating medicinal plants including a cadastre of medicinal plant resources in the territories under its jurisdiction.

The Director of the NFB is responsible for development of a section “Medicinal plants” within each of the forest management plans and programs in compliance with the Forestry Act.

A director of the state forestry unit:

- Organizes medicinal plants conservation within the state and municipal forest fund on their respective forest territory;
- Issues licenses for medicinal plants used from the state and municipal fund of the forestry territory.

The director of the state forestry unit exercises control over the use and reproduction of medicinal plants within the forest fund.

The Role and Responsibilities of Local Administrations

The regional government is required to ensure compliance with the (eventual) national strategy and to include matters of medicinal plant management within municipal programs on environmental protection. By law, these will include medicinal plants collection, conservation and propagation.

District Governors:

- Coordinate the mayors' programs regarding development of the "Medicinal plants sections" of municipal programs;
- Take actions for conservation of the wild medicinal plants within the territories of the state-owned land fund and by issuing licenses for medicinal plants use;

The mayor of the municipality governs the activity of the municipality regarding the use, conservation and cultivation of medicinal plants, by:

- Organizing execution of activities related to the medicinal plants, which are included within the municipality environmental protection program;
- Issuing licenses of medicinal plants used from the municipal lands, forests, waters and waters bodies;
- Issuing Certificates on herbs from cultivated medicinal plants;
- Provide the Minister of Environment and Waters with information about the monitoring of medicinal plants and cadastre for the territories under his jurisdiction.

1.1.3. Permits and Licenses

There are two statutory requirements for non-timber forest products:

- Permits are required for commercial collection
- Licenses are required to purchase and process medicinal plants for commercial use

Licenses and/or permits (as terminology) are typically used interchangeably.

A license/permit is **not** required at present for personal use, or cultivation of medicinal plants; this includes medicinal plant species with special regimes of use. Quantities of herbs and mushrooms for personal use that can be collected without a permit, are specified in the Medicinal Plants Act, and again, in the management plans for protected areas (e.g. Rila and Central Balkan National Parks (2001-2010).

Territorial management units issue the permits. For example:

1 The Director of the National Parks issues the permits for commercial collection of medicinal plants, wild fruits and mushrooms on the Park territory;
2 The Director of State Forestry Unit issues the permits for commercial collection of the same on 3 different territorial units – state forests, municipal forests, and private forest units;
3 The District managers or municipal mayors issue licenses for municipalities and district lands falling outside the forest unit.

Commercial collection permits are issued on an individual basis. Permits typically include:

- species for collection
- quantities permitted, by morphological parts types
- region or habitats from which collection is allowed
- methods of collections
- duration of the permit.

Each person requiring a commercial collection permit must apply to the relevant authority. Each application must include: name, place of residence, identification card data, type of resource, and quantity of use, as well as region of collection. The law requires each administrative unit to issue the license within one-month period from the date of application, unless additional clarification is necessary.

Applications can request permits for each species they wish to collect. Multiple species permits are not provided. There is no application fee, and all taxes (surcharge) on quantities are calculated in advance of collection.

Quantities (norms) associated with any resource are specified by medicinal plant management technical plans. In the absence of a medicinal plants technical plan, the quantity of any resource is set by the relevant administrative body – most of these quantities are set on historical rather than assessed yields. There are few medicinal plant technical plans (and fewer non-timber natural resource assessments) operational in the country.

Licensing therefore, is theoretically only limited by resource availability and quantities as specified in appropriate technical plans. Refusal to license a collector must be completed within 5 days of application receipt. It is also against the law to issue a collection license that contradicts relevant technical management plans for NTNRs.

Collection methods are regulated and will soon be published by the Ministry of Environment and Waters *(this regulation is under preparation).*

Amendments to a license can be undertaken ONLY by the issuing authority, and upon request from an existing license holder. A license can be revoked only by order of the issuing authority. Licenses can be revoked in case the holder has damaged or destroyed the medicinal plants' habitats.

Taxes are determined and approved by the Council of Ministers. Currently a tariff in compliance with Decrees of the Council of Ministers No. 93 and 94 of 29.05.2000 (State Gazette No. 46 of 2000) is valid[1].

Commercial tax collection from NTNRs is credited to the following state funds:

1. Bulgarian National Forest Fund (when originating from NTNRs collected from within state forest fund lands; this Fund is no longer operational);
2. National Environment Protection Fund (when collected from National Parks);
3. Municipal Fund for Environmental Protection (when collected from municipal lands within both the forest and land fund);
4. State budget (when collected from habitats on state lands within urban areas and land fund).

The law specifies that these taxes should be used for developing Medicinal plant technical plans (management plans), reproduction and maintenance activities, scientific study and monitoring, medicinal plant cadastre development and maintenance, cultivation, training, and publishing of educational materials.

Any commercial license issued to purchase and process medicinal plants, as well as the buy-out points (purchase stations) shall be registered with the RIEW.

The Buyers of herbs or those responsible for preliminary processing shall:

- Notify the respective RIEW for the establishment of purchasing stations and storage facilities before starting operation;
- Keep an account of all purchases including quantities; these shall be kept in a book registered with the RIEW;
- Provide access to all medicinal plants, their documentation, as well as processing facilities and techniques, as required by an inspector;
- Provide their respective RIEWs with information on the types and quantities of medicinal plants purchased during any fiscal year, as well as for the herbs in stock.

Anyone can purchase herbs, as long as they meet these requirements.

All pharmaceutical, perfume, cosmetic, and food industries, as well as the owners of herb-stores that have purchased medicinal plants in support of their commerce shall have until January, 31 of each year to submit to their respective RIEW, “generalized” information concerning the type and quantities of herbs purchased, and distributed/exported during the respective year, as well as the quantities in their stock.

The requirements for purchasing wild mushrooms is regulated by the Forest Act.

[1] The taxes for use from municipal lands are fixed by the respective municipal councils at the rate of not more than of the amount of the taxes determined by Decrees of the Council of Ministers No. 93 and 94.

According to this Act, legal entities and individuals (tradesmen as defined by the Trade Law) can organize mushrooms production, purchasing and processing upon submission of an application to the respective state forestry unit. This registration must be accompanied by a list of people engaged directly in mushroom collection.

1.2. The National Experience in the Cultivation of Medicinal Plants

Aromatic and medicinal plant cultivation has a long tradition in Bulgaria. There is significant experience and important achievements recorded in the country historically. At the outset of this industry, oil-bearing roses, and different types of spices, such as fennel (*Foeniculum vulgare*), cumin (*Cuminum cyminum*), coriander (*Coriandrum sativum*), anise (*Pimpinella anisum*), poppy (*Papaver spp*.), thyme (*Thymus spp. div*.), etc., were grown commercially.

At the beginning of 20th century, Bulgaria experienced a growing interest in the development of ethereal oil production, particularly from cultivated plants. Experimental work began in the farm schools and agricultural research stations in Sadovo and Kazanlak.

In the beginning of the 1940s, more intensive management of medicinal plant stocks, as well as technology improvements, increased outputs, as well as reduced costs. 40 medicinal plant species were the focus of a successful national industry, with a significant export market. These included: mint (*Mentha piperita*), fennel, balm *(Melissa officinalis)*, hyssop (*Hyssopus officinalis*), savory (*Satureja pilosa*), common valerian *(Valeriana officinalis*), thyme, cranes-bill (*Geranium macrorhizum*), lily-of-the-valley (*Convallaria majalis*), banewort (*Atropa bella-donna*), basil (*Ocimum basilicum*), common rue (*Ruta graveolens*), medical hollyhock *(Althaea officinalis)*, etc.

The medicinal plants obtained from cultivated plants range between 25 – 30% of total medicinal plant collection in the country. At present, there is a growing commercial interest in increasing the amount and type of medicinal plants under cultivation in response to a huge increase in international demand for pharmaceutical derivatives, pharmacology, nutrition, and health remedies that are part of a global economic interest.

Cultivation is considered a viable alternative to wild harvesting, but there is still limited experience with production of high quality medicinal plant material with sufficient concentrations of valuable biological elements. There is a growing demand for certified organic production of medicinal plants, exhibited by several organic agriculture projects in the country. SAPARD (EU pre-accession funding), and National Environment Protection Fund funds are available for both medicinal plant cultivation and organic medicinal plant cultivation.

Agricultural extension services, especially those for cultivated medicinal plants, are seriously constrained by fiscal problems. There are several institutions addressing cultivation and “ex-situ” conservation of medicinal plants. These include the Institute of Botany/Bulgarian Academy of Science, the Institute of Rose and Ethereal oils, in the town of Kazanlak, and the Institute of Genetic Resources in Sadovo.

1.3. National Association of Consumers, Buyers and Exporters of Non-Timber Natural Resources

The Bulgarian Association of Herbs and Mushrooms Collectors (BAHMC) is an independent and voluntary association that unites individuals and legal entities in the area of herb and mushroom production, as well as the trade with herbs, mushrooms and wild fruits. It works to protect the professional and economic interests of their membership. BAHMC is a registered, non-profit, legal entity.

The objectives of the Association are as follows:

- to unite all "physical bodies and legal entities" in the area of herb and mushroom production, as well as in the trade with herbs, mushrooms and wild fruits. To protect their professional and economic interests;
- to work for the protection and the conservation of the natural sites with herbs, mushrooms and wild fruits in the country;
- to assist the process of increasing the sites with herbs, mushrooms and wild fruits through cultivation;
- to turn the herb and mushroom collection, and the trade with herbs, mushrooms and wild fruits, into a sustainable lifestyle for population in certain geographic areas;
- to assist the development and the enforcement of new legislation;
- to lobby the Government and seek legislation that benefits herb, wild fruits, and mushroom collectors in the Republic of Bulgaria;
- to establish and maintain contacts with similar organizations, international non-governmental organizations, and institutions from the European Union and other regions.

The BAHMC will accomplish these objectives though:

- Support, assistance and protection of its members to achieve higher economic profits;
- Organization of courses and workshops to increase the knowledge, skills and the qualification of its members;
- Organizing and informing its members on the developments of legislation for herb, wild fruit, and mushroom collection, and the trade with herbs, mushrooms and wild fruits;
- Providing methodological assistance to its members in the collection and the use of herbs, mushrooms, wild fruits, promoted through new technologies for cultivation;
- Assisting the members of the association to get preferential treatment in the international markets regarding taxes, customs tariffs, and others.

The BAHMC is a national structure. The membership in the association is voluntary. All functioning bodies and legal entities, which deal with the production and trade with mushrooms, herbs and wild fruits, can become members of the association.

The BAHMC was established in 1999. Its activities to date have included a critical analysis of relevant legislation, to provide information about the markets, and to provide contact with the governmental institutions. In addition, they have contributed to appropriate regulations and changes to financial mechanisms for the use of medicinal plant and mushroom resources and

associated tariff fees. The association publishes a bulletin which covers current issues and changes in the legislation. There is no apparent regularity to the publication, but approximately 3/year are published.

Other branch organizations are: the Association of Herb Collectors in the town of Pazardjic and the Bulgarian Union of Herb Collectors. They have few, and mainly local, activities.

1.4. Supply Chain Characteristics of Non-Timber Natural Resources

The commerce in medicinal plants and mushrooms contains a serious and highly specialized set of actors:

- Collectors (direct collection);
- Buyers of herbs, wild fruits, and mushrooms (organization of the collectors, purchasing and primary treatment);
- Brokers (middlemen);
- Exporters (international markets); and,
- External Processors (secondary or final treatment, packaging and sales of products).

The spine of this infrastructure is the groups of collectors, buyers and exporters, since the trade with non-timber resources is mainly oriented to export markets. Brokers are fast disappearing in this chain, as they are increasingly unable to add value without unacceptable increases in costs.

Processing of these resources in Bulgaria is considered limited and competitive. Because of prevailing national economic conditions, import restrictions, and the necessity for high investments in equipment and operations, significant "in-country" value is not added to raw materials.

Personal Collection

Before addressing the supply chain, it is important to understand the dynamics associated with the personal collection of medicinal plants. For many citizens, this is a right, and a knowledge, acquired over generations. There is little formal information available on trends and demands in personal medicinal plant collection in the national context. But it can be safely assumed from observations that well over 50% of the day visit traffic (during spring, summer, and early fall) to a protected area, will result in some collection of plant material for personal use. There have been no studies to indicate the percentage of these that are medicinal plant users.

The first studies on trends in personal, NTNR, consumption patterns were prepared during the development of the management plans for Central Balkan and Rila National Parks. Personal medicinal plant collection trends show an average, annual consumption, measured in **kilograms/household**, for communities around the Parks:

	Rila	Central Balkan
Wild fruits	9	11
Mushrooms	19	12
Herbs, teas and spices	4	3

As a consequence, these quantities represent significant volumes of medicinal plants (particularly fruits and mushrooms) that are collected for personal use.

National Park	Approx. Number of households	Household Use (in kilograms)	
Rila	31,000	Fruits	279,000
		Mushrooms	589,000
		Herbs	124,000
Central Balkan	26,000	Fruits	286,000
		Mushrooms	312,000
		Herbs	78,000

The approximate number of households is taken from all those communities within a distance of between 25-30 km of the Park boundary. Survey information was based on demographic information for households, and was accurate as of 1998.

This information does not include those people from outside this catchment zone who also come to these two protected areas for personal collection of medicinal plants.

Clearly, these amounts represent significant value to local households. The wild fruits collection alone has an average market value of over **1 million BGL**, with the average prices of a kilo of wild fruit calculated at 2 BGL/kg.

Commercial Collectors – Pickers and Harvesters

In most cases, collectors are unemployed, pensioners or people with very low incomes. A great percentage of them are Roma. Collection is most often local, but there are instances of migrant labor being organized from other areas, particularly prior to the Medicinal Plants Act, when priority was given to individual rather than licensing of commercial collection. The collection is often done in family groups, or organized in "brigades".

Commercial collectors can be divided into two sub-groups - permanent and temporal collectors.

The permanent collectors practice this activity in a sustainable manner and have established relationships and trust with buyers and middlemen. This sub-group most often consists of 10-15 local people per purchasing-processing station (buy-out) point. They are often the most knowledgeable of the resources, their locations, and their biophysical characteristics. They are NTNR-medicinal plant, collection "professionals". Often this sub-group diversifies its collection strategy by collecting "non-profitable" non-timber natural resources – to supplement domestic supplies, or supply minor community needs.

"Temporal/seasonal" collectors are numerous and get involved in "collection campaigns" for a shorter period of time. The buyers and the brokers have higher requirements of this sub-group with respect to the quality of the resource collected.

The success or the failure (for brokers and buyers) of the main, bulky and "priority" commodities (often fresh plant material/fruits), depend on the responsible participation of this group. The collection of St. John's wort, blueberries, raspberries, juniper, lime tree, ceps (mushrooms - squirrel's bread), and chanterelle, is typically conducted in a campaign fashion.

The Medicinal Plants Act requires that all collection for commercial purposes must have source and origin collection permits issued by the managing administration of each territory. Thus collectors selling their daily collection must have a collection permit.

Buyers

Frequently**, buyers** are Bulgarian medicinal plant professionals, and are local residents. After purchasing, they often perform preliminary processing. This may include drying, shredding, cleaning, and packaging – both temporary or more substantive packing. The purchasing and/or the preliminary processing takes place at the buy-out points, or more often at processing stations associated with each buyer.

Buy-out stations can be divided into two types – (1) a purchasing station, where only cash transactions are conducted, and crates, tubs, or transport flats filled with wild products; or (2) a purchase-processing station, that performs preliminary processing – cleaning, drying, stacking, sorting and packaging.[2]

Stations could be also divided into – "permanent and seasonal/temporary". Local companies and consumer cooperatives often operate or subsidize more permanent stations. Companies with distant headquarters in the country, usually open and subsidize a seasonal facility and enter into a sub-contract with buyers. Very often the owners of both types of stations are the buyers and members of their families.

Apart from registration with the RIEW, there are no other special legal requirements or special qualifications needed for operating a buy out/processing station. Qualifications and experience are more often acquired, than taught. Older buyers, however, (between the ages of 50 and 60) have often finished qualification courses for purchasing and processing organized by the Central Cooperative Union[3].

[2] N.B. Mushrooms are bought fresh; seldom, if ever, bought in dry form. Most fruits and mushrooms require immediate refrigeration.

[3] Since the Central Cooperative Union was the main monopolist for medicinal plants between 1955 and 1990, it ensured the qualification of the buyers.

All buy-out and processing stations are subject to the regulations of the Medicinal Plants Act. Specifically, they must keep records of all commercial transactions, and provide this information at the end of each fiscal year, to their respective RIEW. This provision covers all medicinal plants. It does not cover mushrooms.

Middlemen

Typically, these people who perform one of two functions – both are an attempt to add value to a product before it passes on to the next individual in the supply chain. Middlemen will buy from collectors and sell to the buyers; and/or they will buy from the buyers and sell to appropriate companies. Frequently herbs, fruits and mushrooms are bought close to territorial boundaries, or close to villages where there is no purchasing station, or a station that is not registered with the RIEW.

Most often, middlemen are found operating during seasonal, intensive collection campaigns of perishable wild products (mushrooms, blueberries, raspberries, rose hips, etc.). Their activity connected with the collection of herbs is significantly more limited. They continue to function because they perform a role during an intensive harvesting period; they are often attempting to fill quotas for commercial company contracts aimed at export markets.[4]

None of the laws make any provisions for, or regulate this function. Middlemen are not registered, do not pay taxes, and do not issue any receipt or sales documents.

Commercial Processors and Exporters

There are approximately 40 companies that deal with medicinal plants and that operate in the country (Appendix 1-D) on a significantly larger scale than most buyers and local processors. They are largely focused on export markets, and they typically export 70-80% of the total annual harvest of herbs, mushrooms and wild fruits. Some of these companies operate within specific geographic regions exclusively, while others have an extensive network of commercial representatives and storage facilities spread over the country.

Typically, cash is advanced to buyers against estimates for yields matched with export demand and contracts. Storage stations can be a significant part of the supply chain, depending on the annual variability of wild yields.

A number of these companies export fresh and frozen fruits, while others are occupied with much more significant processing (packaging of herbs for the pharmaceutical industry, production of herb teas and spices, tinned mushrooms, jams, marmalade and others).

[4] Typical example in this respect was the huge campaign in 1997/1998 with the collection and trade of St. John's wort.

MARKETS

Almost all wild medicinal plants have both a domestic and international market. Nationally, herbs that have undergone primary processing (usually cleaning and drying) are sold to pharmaceutical companies, and are also used as phyto-products in the production of cosmetic and perfume goods, and for the production of foods and spices.

There are four market categories (containing a total of 208 medicinal plant species) worth noting:

1. 22 species of herbs and fruits form 98% of the annual volume, and are destined for international markets;
2. 56 additional species of herbs and fruits are used in the national market;
3. 105 additional species of medicinal plants - 75% of these are exported; and the remaining 25% are sold on the national market;
4. 25 species of medicinal plants which are sold with almost equal distribution on both markets.

International Markets

International market demand drives a major portion of the current (and the potential) use of the non-timber natural resources, regardless of local market fluctuations. Bulgaria has always been a medicinal plant/herb exporter, and herb exports remain an important part of the national economy. 70-85% of the collected, purchased and processed herbs and wild fruits (between 8,000 to 17,000 tons annually) are destined for export. Of all herbs exported, 70% are from wild plants and the remaining 30% are from cultivated sources

Until 1990, herb, mushroom and wild fruit commerce was a state monopoly, carried out through the Central Cooperative Union, represented by a company called Bilcoop. The Consumers Cooperatives and the Cooperative Unions carried out the collection and the primary processing. The former National Committee of Forestry also dealt with the collection and commercial activities associated with wild fruits and mushrooms.

The structure of the herb and mushroom industry was transformed after 1990.The work of Bilcoop was seriously reduced. Newly created, private companies formed and started purchasing and exporting non-timber natural resources. The transformation affected not only the organizational structure of the industry, but the structure of the market as well.

Bulgaria ranks first place in Europe for export of herbs and is reported fifth in the world after countries such as China, India, Brazil. During 1992-1998, between 6,400-15,446 tons of product were exported. The average export price of Bulgarian herbs is presently 1.47- 2.29 USD/kg. The export market includes primarily 20 countries. The biggest market is Germany. It receives between 6-7000 tons per year. Other major markets are Italy, Spain, the USA, and Switzerland, in order of importance.

The data of the BAHMC show that the trade with herbs and mushrooms has decreased for the last three years due to internal and external reasons. The main internal reasons are the "increased" tariff fees and valued added tax (VAT - sales tax) This leads to higher export price for the Bulgarian herbs. A higher price does not help keep Bulgaria competitive with exports from Romania, Poland, Hungary, Ukraine, etc.

There is also another disturbing trend – there has been a noticeable decrease in the quality (potency) of Bulgarian herbs due to poor technology, premature collection, and poor phyto-sanitary conditions associated with processing and storage facilities.

National Markets

Local markets of medicinal plants and wild fruits include:

1. Trade with medicinal plants and herb tea remedies within the pharmaceutical network of the country. Bulgaria posses a huge variety of herbal teas and traditional remedies in infusion form;
2. Production and trade with the pharmaceutical enterprises;
3. Production and trade with commercial herb and fruit teas;
4. Production and trade with spices and food supplements;
5. Production and trade with NTNR raw materials for the cosmetic and perfume industries;
6. Production and trade with canned fruits and processed fruits: squashes, juices, jams, marmalades, jellies, fruit yogurts, ice-creams, and others;
7. Fresh wild fruit domestic sales.

Export Licensing Procedures

The procedures for export of non-timber and plant product are regulated by CoM Decree No 233/8.11.2000/State Gazette 93, from the year, 2000. According to this legislation (Article 3, paragraph 1, sub sections g, m, n) the following commodities need licenses:

1. Introduction, export and re-export of endangered species from the wild flora and fauna included in the Washington Convention for International Trade with Endangered Species (CITES) The requirements of the Convention and the Nature Protection Act should be enforced;
2. Export and re-export of wild plants, and their parts, including cultivated ones, lichens and mosses – in compliance with the Environmental Protection Act, Nature Protection Act, Medicinal Plants Act and the Forests Act (MoEW is the institution which issues these permits);
3. Export and re-export of wild mushrooms including cultivated ones in compliance with the Forests Act (MoAF is the institution which issues the permits).

Special Regulation (annex 4 to article 7 of the same Decree) guides the registration of all international contracts dealing with NTNR exports. Export contracts should be registered. Each exporting company is required to fill 2 application forms and obtain a certificate for export and/or import from the competent national institutions (MoEW or MoAF).

Applications must include samples of contracts, invoices, phyto-sanitary certification, a trade license, registration certificate, and other documents verifying data in the application form. In compliance with the Medicinal Plants and Forests Acts, the documentation should also include a certificate of origin (permits or certificates for cultivation) which states where and in the manner the way the product was obtained.

The application must be reviewed within 5 days. Export licenses are valid for three months, and are typically signed by an appointed representative of the relevant Minister.

1.5. NTNRs in the Context of Central Balkan and Rila National Parks

Location of Rila and Central Balkan NP in Bulgaria

The main sources of information about these resources (taxonomic composition, diversity of species, ecological and biological characteristics, state of the populations and nature conservation importance) in both National Parks are taken from several sources. These are included in the bibliography. However, those sources most relevant to our understanding of NTNRs in Bulgarian National Parks are taken from:

- Field studies carried out under the USAID supported Bulgaria GEF Biodiversity Project, in preparation for the Management Plans for Rila and Central Balkan National Parks;
- The Bulgarian-Swiss Biodiversity Conservation Program (BSBCP) for the high-mountain tree-less zone in the Central Balkan National Park.

Taxonomic, Ecological, Biological and Conservation Characteristics

The non-timber natural resources of economic value in both National Parks consist of:

- 18 species of economically significant edible mushrooms (*Macromycetes*);
- 1 lichen species; and
- 173 species of high-vascular plants.

The ratio of commercially valuable species to the total number of species can be described as follows:

- 10% of the edible mushrooms are found within both Parks;
- 46% of the mushrooms with commercial value; and
- 69% of the species used as herbs and wild fruits.

The distribution of the economically valuable species according to the main taxonomic categories is shown in Table 1 for each Park (Appendix 1-B).

Mushrooms (Macromycetes)

The overall number of the mushrooms found in the Central Balkan NP is 256 or 12% of the total number of macromycetes in the country. 10 of these species belong to the category of economically valuable, edible mushrooms.

There are 233 species in the Rila National Park, which comprise 11,6% of the total for the country. There are 11 species of economic significance. Table 2 (Appendix 1-B) shows the list of the edible mushrooms in both Parks.

From taxonomic point of view the edible mushrooms belong to the class *Basidiomycetes*. The economically valuable macromycetes are more wildly distributed in the forest ecosystems (mainly in coniferous and beech communities) and to a smaller degree in the sub-alpine shrub and grass communities.

The above mentioned species have extremely valuable commercial properties. According to Drumeva, Gyosheva (1995), the edible mushrooms registered in both Parks belong to two categories. The first one includes species that are annual fruit-bearing, and are collected in the wild (represented in the two Parks by 13 species). The second category is represented by 5 species and belong to the relatively rare macromycetes that are perennials, and wildly collected.

Nationwide the edible mushrooms, which belong to these two categories, are the most vulnerable ones. Their vulnerability stems from their uncontrolled collection and the high level of collection, threatening reproductive stock. As a result, the endangered species (in both Parks) include 7 species of macromycetes (*Boletus aereus, Boletus aestivalis, Boletus edulis, Boletus pinophyllus, Cantharellus cibarius, Craterellus cornucopioides*, *Xerocomus badius)*, which should be monitored and managed in a sustainable fashion.

Medicinal Plants

Table 3 (Appendix 1-B) shows data for the medicinal plants.

The medicinal plants with consumptive uses in the Rila NP are represented by 162 species (of 250) or 64.8% of those medicinal plants widely used in the traditional and non-traditional "medicine". There are 166 species of medicinal plants in Central Balkan NP or 66.4% of those in the country.

The taxonomic distribution of the medicinal plants is as follows:

- the greatest number includes angiosperms (*Magnoliophyta*) - 159 species or 91,4% of total, from which 147 species or 84% belong to the dicotyledonous plants (class *Magnoliopsida*) and 12 species or 6% belong to monocot plants (class *Liliopsida*).

The rest are divided as follows:

- gymnospermous (*Pinophyta*) - 3 species;
- ferns (*Polypodiophyta*) - 6 species;
- horse-tail (*Equisetophyta*) - 1 species; and
- Club moss (*Lycopodiophyta*) - 2 species.

One species is a representative of the lichens.

The largest number of species are represented by these families:

- *Asteraceae* - 19 species;
- *Rosaceae* - 18 species;
- *Lamiaceae* - 14 species;
- *Liliaceae* - 7 species;
- *Scropulariaceae* - 7 species;
- *Fabaceae* - 5 species;
- *Apiaceae* - 6 species;
- *Polygonaceae* - 6 species;
- *Ranunculaceae* - 6 species, (etc.)

According to floristic character, medicinal plants are divided into:

- trees – 8 species;
- shrubs and short trees – 29 species;
- perennial grass – 109 species;
- biennial grasses – 8 species;
- annual grasses – 14 species; and
- transitive types – from biennial to perennial – 2 species;
- from annual to biennial – 2 species;
- annual to perennial – 1 species.

Depending on their renewal potential (manner of reproduction) there are predominant species, which have not only spore or seminal reproduction but also vegetative - 115 species or 66% of total. The remaining part is distributed between the species which have seminal reproduction (48 species) or vegetative ones (5 species).

Depending on their vertical distribution, the diversity of ecological niches, (relief, rock foundation, soils, hydrology) and the anthropogenic impacts, the medicinal plants are evenly distributed in the National Park areas. They occur in the tree, shrub and grass communities.

Some of them are dominant and cover vast areas. These include the juniper, *(Juniperus sibirica),* the cowberry, and the bilberry (*Vaccinium vitis idaea, Vaccinium myrthillus*), the silver birch *(Betula pendula)*. Others such as the snowdrop (*Galanthus nivalis*), the yellow gentian and the dotted-flowered gentian *(Gentiana lutea* and *G. punctata*), and the garden rhubarb (*Rheum rhaponticum*), have limited distribution and are of conservation significance.

Differences in habitat-types, or biomes, define the diversity of the medicinal plants in the vertical elevations. The diversity of the medicinal plants is biggest in the hornbeam *(Carpinus betulus) ,* durmast oak *(Quercus petraea),* beech *(Fagus sylvatica)* and coniferous biomes. These medicinal plant populations occur with the highest degree of vitality and with good biological properties. The following medicinal plant species are found in these biomes:

- thyme (*Thymus spp. div*.);
- raspberry (*Rubus idaeus*);
- St. John's wort (*Hypericum perforatum*);
- wild strawberry (*Fragaria vesca*);
- common speedwell *(Veronica officinalis*);
- cowslip (*Primula veris*);

as well as some species from the lady's mantle (*Alchemilla vulgaris complex*). The latter are located in the high mountain meadows, around the forests and in sparse forests.

The following species are widely spread in the beech forests:

- bedstraw (*Galium odoratum*);
- ramsons (*Allium ursinum*);
- common geranium *(Geranium macrorrhizum*).

Interestingly, bilberries and cowberries (*Vaccinium myrtillus, V. vitis idaea*) and common geranium (*Geranium macrorrhizum*) are known from coniferous forests and in many instances, are wide-spread.

The humid gorges of rivers, streams and moist rocks are inhabited by species from the mezohygrophytes, such as the male fern *(Dryopteris filix mas)*, polypody (*Polypodium vulgare,*), king-cup (*Caltha palustris*), and angelica (*Angelica pancici*, *A. sylvestris*).

The areas above tree line, in the sub-alpine belt, are inhabited by bilberries and cowberries (*Vaccinium myrthillus, V. vitis idaea*), different types of lady's mantle (*Alchemilla vulgaris complex*), wild strawberry (*Fragaria vesca*), wild pansy (*Viola tricolor*), eyebright (*Euphrasia officinalis complex*) and others.

The meadows in the alpine zone, as well as the steep slopes and rocks, are inhabited by xerophytes and mezophytes. Some of them form a considerable portion of available resources. These are:

- Icelandic lichen (*Cetraria islandica*);
- bilberries and cowberries (*V. myrtillus, Vaccinium vitis idaea*);
- different types of lady's mantle (*Alchemilla vulgaris complex*);
- eyebright (*Euphrasia officinalis*); and
- thyme (*Thymus spp.*).

Some of the medicinal plants in these areas also occur with high conservation value. Specifically, these include:

- the yellow gentian (*Gentiana lutea*, *G. punctata*);
- some rare species of Lady's mantle (*Alchemilla spp.*);
- bearberry (*Arctostaphyllos uva ursi*);
- sundew (*Drosera rotundifolia*);
- garden rhubarb (*Rheum rhaponticum*);
- rose-root (*Rhodiola rosea*); and
- angelica (*Angelica pancicii*).

In the zones with significant human impact (around chalets, roads, paths, dairies, etc.) there are medicinal plants from the group of anthropophytes such as:

- ribwort plantain, rat-tail plantain *(Plantago lanceolata, P. major*);
- common wormwood (*Artemisia vulgaris*);
- horse weed (*Tussilago farfara*);
- sorrel (*Rumex acetosa*);
- common dandelion (*Taraxacum officinale*), whose presence and stock impact the processes of restoration of the root vegetation.

Very typical in this respect are the anthropophytic communities which have emerged near the farms and places inhabited by domestic animals. These communities are well spread in the Parks and have a considerable amount of monk's rhubarb (*Rumex alpinus*), nettle (*Urtica dioica*), all-good mercury (*Chenopodium bonus-henricus*), mullein (*Verbascum longifolium*), milfoil (*Achillea millefolium*), and common tansy (*Tanacetum vulgare*).

Medicinal plants fall into different categories of conservation significance, depending on the threats and the degree of being endangered, at national and regional levels.

- The Red Data Book of Bulgaria (RDB) includes 20 (5 endangered and 15 rare) species from Rila National Park and 22 (4 endangered and 18 rare) species from Central Balkan National Park;
- 10 species from Rila National Park and 5 species from Central Balkan National Park are protected by the Nature Protection Act;

- 22 species from Rila National Park and 20 species from Central Balkan National Park are under a special regime for use;
- the CITES list includes: snow drop (*Galanthus nivalis*) and several species from the *Orchis* genus, (*Orchis coriophora, O. laxiflora, O. mascula, O. morio, O. pallens, O. simia, O. tridentata).* These species together with the bearberry (*Arctostaphyllos uva ursi),* yellow gentian *(Gentiana lutea)*, buckbean *(Menyanthes trifoliata)*, Icelandic lichen (*Cetraria islandica*), and stag`s horn moss (*Lycopodium clavatum*) are in the list of endangered medicinal plants, stated in Regulation 338/97 of the European Union (Medicinal species, and the listing in the annex of Regulation 338/97).

Current regulatory documents in force in both National Parks allow medicinal plants on their territory to be divided in the following groups: (See Table 3, Appendix 1-B):

1. 10 species prohibited for collection - these are protected by the Medicinal Plants Act;
2. 21 species allowed only for personal collection in quantities defined by the law and the National Park management plans. These species are considered under a "restricted regime of use";
3. 152 species which could be collected in accordance with the management zone plans for each Park, and allowed by law.

The total number of medicinal plants in both Parks is 215.

Morphologically they could be classified as follows:

- roots - 23;
- root system - 5;
- tubers - 2;
- leaves - 37;
- stems - 98;
- blossoms - 20;
- berries - 23;
- seeds - 1;
- bark- 6;
- buds - 1.

2. NTNR Pilot Program

2.1. Background

The goal of the Biodiversity Conservation and Economic Growth (BCEG) Project NTNR pilot program with Central Balkan and Rila National Parks is to establish an operational model for Collaborative management of non-timber natural resources within pilot regions in both Parks. The BCEG Project and the pilot program is funded by USAID, and implemented by Associates in Rural Development (ARD), Inc., as contractor.

The pilot program is an important part of the country's first ten-year protected area management plans that were approved by the Councils of Ministers in June 2001. Plans were approved following a long process of public hearings and institutional scrutiny provided for in the Bulgarian, Protected Areas Act.

Pilot program areas were selected as the outcome of public hearings and focus group discussions prior to approval of both Park's management plans. Collaborative management activities of non-timber natural resource harvesting and what it means for Park relationships with surrounding communities, the local economy and businesses, were discussed. Participants from around both of the National Parks had the opportunity to share their impressions and ideas for the establishment of mutually beneficial partnerships.

The objectives of the pilot projects are as follows:

- Development of more effective regimes and regulations for management of the natural resources in the pilot areas on the territory of the Park, together with these groups;
- Creating new possibilities for increased market value of the resources, which are collected in and around the Parks.

2.2. What is Collaborative Management of Non-Timber Natural Resources?

The Directorates of Rila and Central Balkan National Parks believe that the only way in which sustainable natural resources management can be maintained is **together with local partners.** They call this program "Collaborative management".

This approach recognizes the continued need and right of individuals to collect NTNRs from the Park territories, and to develop a system that allows collaborative management of these resources for sustainable collection, and conservation. National Parks believe that these negotiations must contain the following elements:

- All consumers with an economic interest in the natural resources in the Park are identified;
- Local collectors of the natural resources are identified;
- The populations of the significant (from conservation and economic point of view) natural resources are identified;
- The territory (area) of collection (operations) is outlined;
- The regimes, regulations and methods for collections are defined;
- Special trainings are organized for buyers and collectors to mitigate negative impacts to wild resources;
- A permit and monitoring plan is developed. It agrees the type of harvested natural resources, the quantities, the place and time;
- The responsibilities of each partner are defined – regarding education, information sharing, public awareness, financing, control, technical support, etc.;
- Conflict resolution procedures are defined;
- The time framework of the "collaborative agreement" is defined.

2.3. Description of the National Park NTNR Pilot Program

The pilot program is implemented in several stages.

1. The first stage is connected with the general orientation of the participants from the Directorate, experts, consultants, representatives of the Government, and the BCEG Project technical team. Three significant meetings contributed to this stage, and include the meetings held in Bistritsa in December 2000 and in Yakoruda and Klisura in March 2001. These meetings agreed strategy, an action plan, and an approach that could be endorsed and implemented by all parties. These meetings were also used to identify members of a national working group that would supervise activities and advise on implications to policy;
2. The second stage is connected with collection of information and situation analysis. The results of this information collection and situation analysis form the basis of the first two volumes of this report;
3. The third stage includes the preparation of Park specific strategies for collaborative management of specific areas and resources, recommendations to policy and Park financial mechanisms, and a specific set of actions that will be taken in advance of the next collection season;
4. The forth stage is the implementation of each Park strategy and action plan, accompanied by appropriate lobbying at national level, education and training, and the development of specific public information materials in support of these efforts. The agreements between Parks and collectors are reflected in a "collaboration contract";
5. The final stage of the operational model includes the analysis of the results of indicators measured and monitored in each Park's action plan, and an evaluation of which steps and procedures need to be changed and/or improved.

Pilot Program Criteria

The selection of pilot program areas was done by each National Park. Their criteria included:

- Existence of sufficient quantities of commercial, non-timber natural resources in the relevant Park regions;
- Suitable provisions in the management plans, and where a zone regimes and norms allow for legal NTNR harvesting;
- The presence of existing practices and infrastructures – purchasing stations, well organized groups of collectors, specific interest of the industry, particularly buyers;
- Social-economical situation in the region –problems with high unemployment;
- Patterns of cooperation existing between the Parks and local authorities.

Klisura Park Section was chosen by Central Balkan National Park. Belitsa and Yakoruda Park Sections, with Yakoruda Township as its center, were chosen from the Rila National Park.

These pilot program areas have succeeded in identifying and coordinating four, well-organized, interested parties:

- **The National Park,** interested primarily in the conservation of the resources;
- **The collectors** of NTNRs, whose main interest is continued access, and collection for personal, as well as livelihood purposes;
- **The local authorities,** whose primary interest is in the economic and social development of the region;
- **The local, small and medium businesses –** herbs-buyers, purchasing stations etc., whose main objective is business and who are profit motivated.

In addition to the four groups, this industry is characterized by well organized, substantial, commercial private companies that deal with the processing and the export of NTNRs.

Pilot Program Coordination and Management Tools

A national working group is formed for the supervision and coordination of activities. It includes (1) representative of BCEG project, (1) the Ministry of Environment and Waters, (1) BCEG consultant, (2) technical representatives of the National Parks Directorates, (2) Heads of Park Sections, and when practicable (1) international BCEG Project consultant.

Operational Level - the pilot programs in both Parks are implemented and managed by the relevant Park Section Heads, their rangers (as necessary). Each Park section is assisted and coordinated by the relevant technical specialist within the Park Directorate – a botany specialist. All field teams report directly to the Director of each National Park. All Park teams are subsidized in their operations through the BCEG Project. Local operational budgets are locally accounted for by pilot program staff, reviewed by Directorate management, and controlled by the BCEG Project. Technical assistance to field teams is provided by the BCEG Project.

Information Collection Methodology

The information presented in the current analytical report is collected from three primary sources:

1 The first source of information on non-timber natural resources in National Parks Rila and Central Balkan is focused on their biodiversity conservation status. Species and conservation significance were determined as part of the scientific resource base inventory conducted in support of each Parks Management Plan. This research was conducted between 1997 and 1999, and is the subject of three volumes, with reference in the bibliography. There are two volumes for Central Balkan National Park, and one volume for Rila National Park;
2 The socio-economic data collected within a catchment area of 25-30 km of each National Park boundary, and forming the basis for an evaluation of local needs and dependencies on resources found within both National Parks. The survey work also covers public attitudes towards the Parks, as well as willingness to pay Park fees. The reference for *People and Parks* is noted within the bibliography, but the socio-economic assessment was conducted between 1997 and April 2000;
3 Survey and interviews conducted by National Park staff during June and July of 2001. Each Pilot area was surveyed and assessed for information related to existing practices regarding NTNRs and to better understand supply chain dynamics. National Park staff were supported in these efforts by the BCEG Project consultants.[5]

Pilot program site interviews were conducted using a standard questionnaire. The questionnaire was the subject of a workshop (for development) and training in advance of its administration. Interviewees were selected in advance of the survey, and specifically focused on categories of people engaged in the economic, social and commercial aspects of NTNRs.

Park Section	Total No. of Interviews	Mayors	Forestry Units	Buy-out points	Buyers	Collectors
Klisura Central Balkan NP	19	3	3	5	2	6
Belitsa/Yakorouda Rila NP	22	4	3	6	4	5

A representative of RIEW - Plovdiv also took part in the preparation of the survey tool and methodology. A Sample Questionnaire is given in Appendix 1-C.

In addition to these two pilot program area surveys, a number of interviews were conducted with national businesses dealing with the processing and/ or trade and export of the natural resources, or their products. National and international consultants assisted with the conduct of these interviews, in August 2001.

[5] Filip Zaikov and Roumen Kolchagov from Rila NP and Marin Kostov and Gergana Staneva from Central Balkan NP conducted the interviews. ARD consultant Chavdar Gussev and the eco-enterprise specialist Kamelia Georgieva, developed the methodology, training, and the questionnaire.

3. Profile and Situation Analysis for NTNR Pilot Program Areas in Rila and Central Balkan National Parks

3.1. Rila National Park – Belitsa and Yakoruda Park Sections

Belitsa Park Section is located on the south and southeastern territory of Rila National Park. The Park Section is an administrative territory, and is supervised and patrolled by a Park Section Head, 6 rangers, using one vehicle and two motorcycles. The Park Section includes a total area 10,129.8 ha, of which 6,435.8 ha are forest and 3,694.0 ha are high mountain meadows.

Yakoruda PS is located on the southeastern potion of Rila National Park, and includes a total surface of 9,957.8 ha, of which forest forms 5,291.8 ha and 4,666.0 ha are high-mountain meadows. This Park Section is managed and supervised by a Park Section Head supported by 6 rangers, two vehicles, and 2 motorcycles.

Both Park Sections are located entirely in the southern watershed of Rila National Park. This area is drained by the Mesta river and by its tributaries (Cherna Mesta, Bela Mesta, Belishka and Draglishka river). Park Sections' altitudes vary between 1,500-2,771 m.

Forests are dominated by predominantly coniferous trees, including spruce (*Picea abies*), Scots pine (*Pinus sylvestris*), Macedonian pine (*Pinus peuce*) and silver fir (*Abies alba*). dwarf pine (*Pinus mugo*) and shrub communities predominate in the sub-Alpine zone. Siberian juniper (*Juniperus sibirica*) dominates the shrub composition of this zone. Grass communities are spread in the high mountain meadows and Alpine zones.

3.1.1. Rila National Park Management Plan

The recently approved management plan for Rila National Park (June 2001) provides a management zone scheme for the Park. This is first National Park management plan for Rila. Both Park sections, and project pilot areas fall within the "multi-purpose" management zone. The Plan describes the regimes (what) and norms (how much) for Park activities. This management zone provides for the sustainable collection of NTNRs.

3.1.2. Human Demographics

The pilot areas fall within the administrative boundaries of Belitsa, Razlog, and Yakoruda municipalities. Each of these administrative areas is inhabited by approximately 11 thousand people, representing approximately 4,000 households Most dwell in small villages and mountain hamlets. The towns and villages of the municipalities are concentrated in the valley floors below the Rila, Pirin and the Rhodopes mountains. Small hamlets are located in most cases, on the slopes of the Rhodopes.

The ratio of men/women is almost equal with a little higher average for women. 60% of the population is between the ages of 18 and 60. Pensioners form the smallest part of the

population, with a high proportion of children found within the area. This is uncharacteristic of Bulgaria, and other parts of the Park, where the population over 60 normally is much higher than the relative population of children.

There are 4 secondary schools for general and polytechnic education in the two municipal centers. There are 8 schools for primary education in the small villages and hamlets. This is surprising and important indicator for the vitality of a region.

An important social characteristic of the area is its social and religious history. More than 50% of the population of Belitsa municipality and more than 60% of the population of Yakoruda, are Bulgarians of the Muslim faith – or "Pomaks". Pomak society tends to be characterized by relatively closed social units, and have a much higher family size than the national average. Many Pomak hamlets are comprised of 3-4-5 family units.

Local livelihood of this region is almost entirely dependant on the region's natural resources - wood harvesting, wood processing, large-scale collection of non-timber natural resources, and to some degree, on agriculture – potatoes and tobacco. Domestic livestock and mountain pasturing supplement these patterns of resource use. It appears that families plan their incomes and labor occupation along with seasons and, considering the natural resources collection, and make their income and expenditure budgets with respect to these activities.

Only 10% of the local population are employed outside the region. National economic restructuring and the closing of local industries have resulted in average unemployment rates for the country – between 10-20%. This is true for the two large towns of the two municipalities. For the villages of the region, the rate of unemployment is much higher, but this is not reflected in the state statistics. These statistics only cover those that register at the municipal unemployment offices. After eight months, these records are no longer kept active.

The unemployment rate for the villages, according to the mayors (and the others interviewed), is over 80%. In fact, many of these people of working age are not unemployed, but are subsistence agriculturists, who work small farms and breed/maintain livestock. Based on household activity patterns, there is a large percentage of each annual household time spent in the collection of wild products (NTNRs). This is a seasonal activity, with a large family involvement. Collection season starts early in the spring with mushrooms, continues with different herbs, nuts, and berries, and finishes with mushrooms in autumn. For many in these rural villages, this is the only opportunity to generate cash income.

Based on the information shared by the mayors of the villages and the buyers and brokers, the average income per year per collector varies between 1,500 and 1,800 Bulgarian Leva, paid only for commercially collected resources. This is a significant input in the average family budget, having in mind that the annual average salary for 2001 for Bulgaria is around 2,500 BGL.

3.1.3. Patterns of Resource Use and Resource Dependence

32 medicinal plant species and 14 edible mushrooms are the subject of commercial interest in the pilot region.

Most of these commercial species are widely spread in the region. Significant populations of medicinal plants (herbs) and mushrooms belong to administrative territories outside of the National Park.

There are six NTNRs located almost exclusively within the National Park territory. They include: bilberry (*Vaccinium myrtillus*) and cowberry (*Vac. vitis-idaea*), butterbur (*Petasites officinalis)*, wild thyme (*Thymus spp*.), mantle (*Alchemilla vulgaris complex)* all-good (*Chenopodium bonus – henricus)* and mushrooms – cep.

Interviews indicate that there are no "special" locations for most of the species. Commercially profitable areas are described as accessible, and are not considered too distant from populated areas and from the purchasing stations. Collection areas are located far up the mountain slopes, and it is not unusual to travel an average of 35-40 km one way, to start collection. NTNRs with the most distant populations are the *Vaccinium spp.* (bilberries and cowberries) found in the high mountain regions, often above 2000 m elevation.

The information available for the types and numbers of commercial collection permits outside the National Parks is very limited. Such information was given by Yakoruda forestry unit, Belovo forestry unit and Belitsa forestry unit, but is very general. It is not helpful to this study.

3.1.4. Commercial Use Trends

The population of the region traditionally collects herbs, wild fruits and mushrooms for commercial and personal use. The collection of mushrooms is the main annual source of income for many of the local people. Transportation to the NTNR collection points is by truck, car, (Lada sedans are preferred), motorcycle or on foot. Collection is undertaken in groups, and is well organized. Individual collection occurs, but most collection takes place with at least one other person. Collectors are not accustomed to camping out and normally return home at the end of each collection day.

Collectors are predominantly of the Muslim faith. They include a broad cross-section of age categories. The most active collectors are between the ages of 30-40 years. A large number of the local buyers and brokers are also Muslim. Collectors and buyers/traders are 100 per cent local people. Collectors from other parts of the country do not come to the pilot region to collect natural resources, as a rule.

Some 800-1000 people are engaged annually in the commercial collection of herbs and mushrooms in the region. The number of the permanent collectors who are regularly linked to the buyer's stations is about 35-50 people per station. This number of relatively permanent collectors forms the core group of families which are almost entirely economically dependent

on the NTNR harvest. In several of the village, these families form up to 80% of the population.

There are 6 purchase/collection stations, and 4 temporary market places associated with this pilot region. Some collectors set up private, roadside stands and sell directly to traffic along the single main road in the region.

Patterns of non-timber natural resources use in the pilot program area are generally unregulated and poorly managed by the surrounding forest department units. Improper collection, collection without permits, and collection from prohibited areas, were noted during the course of information collection. Most interviewees are not aware of plant species governed by special regimes of use.

To date, there is no record of medicinal plant assessments or technical plans made for areas outside of the National Park. Interviewees also report that they experience no problems in obtaining commercial collection permits for resources within and outside of the Park, from either authority.

3.1.5. Local Supply Chain Dynamics

<u>*Resource potential*</u>

These are the following preferred and traditionally collected medicinal plants and wild fruits in the pilot region (the quantities in tons show the potential yield- these are an average, annual calculation, based on information from buyers):

Monk's rhubarb (*Rumex alpinum*) –	5-10 tons (t)
Mistletoe (*Viscum album*) –	5t stems
Silver birch (*Betula pendula*) –	1t leaves
Tansy (*Tanacetum vulgare*) –	10t stems
Wild angelica (*Angelica sylvestris*) –	1t roots
Wild strawberry (*Fragaria vesca*) –	up to1t fruit
Restharrow (*Ononis spinosa*) –	up to10t roots
Cornell tree (*Cornus mas*) –	up to 8t fruit
Yellow galium (*Galium verum*) –	1-2t – stems
St Johan's wort (*Hypericum perforatum/H. maculatum*) –	25t max.–stems
Wild apple (*Malus sylvestris*) –	2t fruit
Blackberry (*Rubus spp. diversa*) –	2t –3 t fruit
Cowslip (*Primula veris*) –	300-400kg – blossom
Lime-tree (*Tilia argentea & T. plathyfillos*) –	1t – blossom
Great mullein (*Verbascum densiflorum*) –	1t – leaves; blossom-limited
Banewort (*Atropa bella-donna*) –	2t – leaves; 3t – roots
Raspberry (*Rubus idaeus*) –	8t – fruit; 2t – leaves
Thyme (*Thymus spp. diversa*) –	400-500kg – stems
Bearberry (*Arctostaphyllos uva-ursi*) –	40-50kg – leaves
Mouse-ear hawkweed (*Hieracium pilosella*) –	1t – stems

Mountain ash (*Sorbus aucuparia*) –	up to 0,3t fruit
Eyebright (*Euphrasia officionalis*) –	2t stems
Juniper (*Juniperus communis/J. sibirica*) –	up to 20t fruit
Cowberry (*Vaccinum vitis idaea*) –	fruit up to 1 tons
Read germander (*Teucrium chamaedrys*) –	stem 1 ton
Black elder (*Sambucus nigra*) –	fruit up to 2 tons
Bilberry (*Vaccinum myrtillus*) –	45 -50 t – berries
Butterbur (*Petasites officinalis)* –	2-3t
All-good (*Chenopodium bonus – henricus*) –	up to1t roots
Mantle (*Alchemilla vulgaris complex*) –	0,3t – stems
Dog-rose (*Rosa spp. diversa*) –	up to15t fruit

N.B. These estimates vary widely, and are primarily used to illustrate both official records as well as informed guesses about yields from the pilot program territory. We know for a fact that the annual average yield for *Vaccinium myrtillus* **(Bilberries) is closer to 50 tons minimum a year for commercial harvesting. If we add berries collected for personal use, these could amount to an additional 20-30 tones of berries collected from this area for a total of 50-80 tons harvested per annum.**

The edible mushrooms gathered and purchased from the region are:

Gyromitra esculenta –	0.2 tons
Skullcap (*Tricholoma flavovirens*) –	up to 15 tons
May-mushroom (*Calocybe gambosum*) –	1 ton
Cep (*Boletus spp*.) –	up to 25 tons
Brown ring boletus (*Suillus luteus*) –	up to 15 tons
Chanterelle (*Cantherellus cibarius*) –	up to 2 tons
Chanterelle (*Armillariella mellea*) –	5 tons
Saffron milky cap (*Lactarius deliciosus*) –	up to 0,3 tons
Tricholoma portentosum –	2 tones
Morel (*Morchella esculenta*) –	up to 10 kg, rarely
Hydnum (*Sarcodon imbricatum*) –	up to 5 tons
Craterellus cornucopiodes –	up to 1 ton
Agaric (*Marasmius oreades*) –	up to 3 tons

<u>*Local Processing Facilities and Wholesalers*</u>

There are freezing facilities for mushrooms and wild fruits installed close to the pilot region, in the town of Bansko – owned by MKD (an Italian-Bulgarian company with approximately 200 workers hired during the summer season), and in Belitsa station – owned by Simone (a company that is not functioning at present).

In the village of Banya, the Bulgarian-Swiss company, “Pirin Extract” has built a modern facility for manufacturing medicinal plant extracts with a focus on dry and liquid extract production from common valerian. It is small facility still operating below capacity.

There is a facility for ethereal oils production in the town of Razlog.

Five purchasing stations are functioning in the region. They are located in the following villages:

- Dolno Draglishte – 1;
- Gorno Draglishte – 1;
- Belitsa – 2;
- Yakoruda – 1.

The latter is owned by the Yakoruda Consumer's Cooperative, and functioning far below capacity.

These stations are managed by registered entities. Buyers are local people. The purchasing stations are registered with the RIEW – Blagoevgrad. The facilities are private property and owned outright. There are no liens or debts on the stations. The stations are properly equipped for purchase and preparation of herbs. Their equipment and storage allows for normal, primary processing of herbs and mushrooms. Baling and drying facilities are available at two of the processing station. Dryer capacity is limited.

The buyers in the region deal with a range of 20-30 kinds of medicinal plants and about 10 species of mushrooms. There is no data for quantities purchased and prepared during previous years.

Buyer preference is to work with larger volumes and limit the number of different species they work with.

Collection and processing is a seasonal activity with the most significant activity in the region between July-August for the bilberries and cowberries, as well as June and September-October for the ceps.

Up to 90% of the region's collection is designed for export. Prices are competitively determined. There is no specific data regarding trading partners. Each of the buyers has developed working relations with 2-3 bigger companies and agents. This is a family business for all buyers, and members of the family have roles during different stages of procurement and processing. Bilyan Tupev and Ivan Petrov have the greatest experience from the region. They have been functioning as buyers of herbs and mushrooms for 20 years and they have attended qualification courses within the CCU system. The rest of the buyers have been working for 7 or 8 years in this business and are self-trained.

Improvised markets/buy-out points for wild fruits and mushrooms are established in four of the pilot area villages: Yundola, Cherna Mesta, Belitsa and Dobarsko. They serve as temporary purchasing stations. Products purchased at these temporary stations are transported every evening to the facilities of several large companies with which the agents have established commercial relations.

Buyers function largely on contract to larger companies. Orders for specific medicinal plants are frequently placed in advance of a collection season, and seldom are lots of any product sold after harvesting.

Local Buyers

Salih Sholiov –	Buyer from ET "Podarev", Belitsa, 2 Osma Str.
Ivan Petov –	Buyer from ET "Buchigo", Dolno Draglishte, tel.0744003/334
Biljal Tupev -	Buyer from ET "Biljal", Belitsa station, tel 23-63
Georgi & Vali Yadkovi –	Buyers from ET "Poleto 1" – tel.074401/464 and 048/834 091, fax 048/994 085.

Local Brokers

Ahmed Haryuv –	Broker, Avramovo
Hyussein Musa Buzyev –	Broker, Cherna Mesta, tel 048/876 201
Ibrahim Muev Karafaiz –	Broker, Cherna Mesta, tel.048/792 609

3.1.6. Vaccinium Species

Bilberries are a profitable and preferred wild, non-timber natural resource for local collectors. Yields of the region are good, but are dependent on climatic conditions. Large volume bilberry purchasing started in 1995, in an apparent response to the collapse of state-controlled economy. Prior to this date, the resource had also been used commercially, but in considerably more limited quantities.

There is no accurate information about the quantities of bilberries harvested from the territories of the Park, and outside the Park. Typically, the collection campaign commences at the end of July and usually lasts for 25-30 days. The main quantities are purchased at the improvised market (purchase station) in the village of Cherna Mesta, where recognized brokers work actively and the prices are highest for the region.

The markets in Belitsa and Dobarsko have a smaller share in the trade, with biberries a more significant part of the resources collected from their specific parts of the pilot region.

Collection is done manually, with the aid of special metal combs – *"borovinkoberachki".* The quantities that can be collected in one day by an experienced collector (during a year with average yields) are between 10-15 kg.

The prices of the fruits at primary buying stations range between 1.5 – 2.8 BGL/ kilogram, as averaged over the last four years.

At the beginning of the 2001 harvest season, the price was 1.5 BGL/kg. During the active collection period, prices rose to 1.8 BGL/kg for non-processed, and 2.0 BGL/kg for processed (cleaned) fruit.

Not less than 350 kg of blueberries were purchased daily on the market in Cherna Mesta during the 2001 harvest season. In more productive years, the quantities of blueberries reached 1,500-2,000 kg daily. At the other markets in the pilot region, the quantities are smaller.

The bilberries are put in plastic cases (flats) and are stored until their transportation each evening. The main bilberry buyer for the last two years has been the MKD company, in Bansko.[6] The company has chambers for flash freezing, and refrigerators where the frozen blueberries are stored until exporting.

Information gathered during the survey indicates that commercial quantities in the region have varied between 30 and 80 tons per annum, over the last four years. These amounts do not take into account those quantities gathered for personal consumption/household use. If these are added, for example (2000 households collecting 10 kg for personal use – or half the total number of households) – then total harvest figures vary between 50 and 100 tons per annum.

3.1.7. Cultivation of Non-Timber Natural Resources in the Pilot Regions

Cultivation of medicinal plants is not a well- practiced agricultural activity in the region. As mentioned before, the main agricultural crops are potatoes and tobacco. There is no tendency among the local population to grow medicinal and aromatic plants, but they have positive attitudes towards cultivation, if profits can be demonstrated to be higher than from potatoes and tobacco. Water plantain (*Lavandula angustifolia),* common valerian *(Valeriana officinalis*), balm *(Melissa officinalis)*, medical hollyhock *(Althaea officinalis)*, etc. are cultivated sporadically. Cultivation of these crops is not permanent; rather, it is greatly influenced by the market. This activity is done primarily by families or by cooperatives. Producers use family land or leased land. There are examples from the region of contract cultivation of medicinal plants. In these cases, contracting companies attempt to ensure quality of product by supplying seed stock and sowing.

The most significant problem with cultivation of herbs in the region is that the purchase of the harvest in many instances is not guaranteed. Tons of undistributed stems of common valerian are presently in store in the region. These results disappoint producers and discourage additional development of economic opportunities.

[6] Bansko town lies at the base of Pirin National Park, and the Pirin mountain range. This Park is another significant source of wild blueberries – but there is no specific information yet collected regarding *Myrtillus spp*. collection for this Park.

3.2. Central Balkan National Park – Klisura Park Section

Klisura Park Section has a total area of 12,728.4 hectares. It is located on the southern slopes of the main ridge of the Zlatitza- Teteven mountain and the Troyan mountain – Stara Planina – or Central Balkan mountain range. The territory is in the water catchment of Topolnitza river (right flows, Vartopska river, etc.) The main ridge has an east-west direction, as the western part is more monolithic and higher (Tetevenska baba peak 2,071 m, Vezhen peak 2,198 m).

The vegetation layer is mainly represented by common beech communities (*Fagus sylvatica*) and the common oak (*Quercus dalechampii*). With more limited distribution can be found the coniferous communities of black pine (*Pinus nigra*), scots pine (*Pinus sylvestris*) and only locally, Macedonian pine (*Pinus peuce*). Predominant in the treeless zone are the shrub and herb communities, characteristic of the sub-alpine and alpine vegetation belts. Most important characteristics of the sub-alpine belt are the formations of communities of the syberian juniper (*Juniperus sibirica*), the bilberries and cowberries (*Vaccinium myrtillus, V. vitis idaea),* met-grass (*Nardus stricta*), different species of fescues (*Festuca rubra, F. balcanica, F. valida, etc*).

The Alpine zone includes communities of the rush (*Juncus trifidus*), sedge (*Carex curvula*), bent-grass (*Agrostis rupestris*), fescue (*Festuca airoides*), *Sesleria comosa*, etc.

Park Section Klisura is a National Park administrative section with its local headquarters in Klisura town. It is equipped with two cars, and two motorcycles. The Park section team is comprised of a section head and six Park guards

3.2.1. Central Balkan National Park Management Plan

A recently approved management plan for Central Balkan National Park is the first for this protected area (June 2001). It provides a management zone scheme for the Park. Park Section Klisura and the pilot project areas are primarily designated as a multi-purpose management zone. Regimes and norms for Park activities within these zones are specified. Like in Rila, this management zone provides for the sustainable collection of NTNRs.

3.2.2. Human Demographics

The administrative territories outside this Park Section are served by Karlovo Municipality. The whole Municipality is inhabited by 74,000 people. Villages of the municipality are situated in the valley between the Stara Planina and Sredna Gora mountains. The Pilot area includes the towns of Klisura, and villages of Rozino, Hristo Danovo, and Karnare.

The ratio in the population of men to women is almost equal, showing a slightly higher percentage of women. The population between 18-60 years forms 57%, while 18% are below 18 years of age, and 24% are older than 60 years of age.

The pilot area of the project includes four settlements of the Municipality. The population of these settlements is around 8 000 people, living in about 2 000 households. In two of the settlements, Rozino and Hristo Danovo, the population is characterized by large groups of Roma – up to 40% in the first and up to 30% in the second. In Hristo Danovo and Rozino 30% of the population are ethnic Turks.

Unemployment rates from the region officially range around 20%. Almost all unemployment is due to the restructuring of the economy, and the closing down and "downsizing" of big industrial enterprises in the region. Actually the unemployment rate is much higher, as the official statistics doesn't keep the record of people who don't receive social benefits for unemployment and those who are given benefits only for several months. In the villages like Rozino and Hristo Danovo, the unemployment rate is closer to 70-80%.

The process of economic restructuring is bringing back to the villages and small towns people who used to leave in the big cities (Karlovo, Plovdiv, Pirdop, etc.) and working for industrial enterprises. According to people interviewed during the summer of 2001, families are coming back and trying to return to the cultivation of herbs, or roses, or to livestock breeding. In general, the settlements are returning to a lifestyle more in keeping with first half of the 20th century. The experiences are however, far from romantic, as agricultural subsidies, loans, and credit schemes are almost completely absent.

In the four settlements, there are two primary, three secondary and one polytechnic school.

Until the beginning of the nineties, most of the Roma used to work in the industrial enterprises or in the agricultural cooperatives, often as low qualified workers. At present, they do not have permanent jobs and rely more and more on the harvest of natural products The collection and sale of such products is increasingly becoming a livelihood for this social group. They collect an abundance of natural products from wherever possible. This includes fruits, nuts, blossoms, mushrooms, and herbs. They collect inside the National Park, outside of its territory, in the forests, along the roads, in private, and on municipal lands.

Approximately 700-800 people are actively working , full-time, during the NTNR collection season, according to the buyers from the region.

3.2.3. Patterns of Resource Use and Resource Dependence

The buyers from the region report that Roma families are the most important commercial collectors. During most of the year, the permanent collectors groups are Roma. They form small brigades, which contain in most cases, several families. Usually all members of these families go to harvest. The youngest children stay at home with the old people.

Based on the information given by the purchase stations, the collectors succeeded during the harvest season (from April until October) to earn an average annual salary (3,000 Lev) per adult (the official norm for Bulgaria in 2001). However, the economic situation of this group remains difficult because of two reasons ascertained during the interviews we conducted. The first reason is that the lifestyle of this group does not include any personal gardening or

livestock breeding. These are both more traditional practices that support subsistence livelihoods for Bulgarian families in the villages and small towns. The second reason suggests that there is not a strong tradition of financial planning and management of household income.

3.2.4. Commercial Use Trends

44 medicinal plant species and 8 edible mushrooms species are the subject of commercial interests in this pilot region. 10 species are widely spread in the region.

The following species are located almost exclusively within the Park Section/Pilot Area. For medicinal plants these include: bilberry and cowberry, wild thyme, mantle, all-good and mushrooms – ceps. These are typically mountainous species, widely spread in the tree, grass and shrub communities in both the mountain and high mountain belts.

Most of the resources of the above mentioned species are located in the Park, and on the territory of the forestry units. Not a small group of species with a significant importance in the commercial variety is found in the agricultural and municipal funds. These are weed and ore species like blowball (*Taraxacum officinale*), dwarf mallow (*Malva neglecta*), common tansy (*Tanacetum vulgare*) etc. For some of these species there are specific location – Ravna, Vartopa, Karagyol etc., but the others are marked just 'in the Park".

An established network of dirt roads provides access to most of the pilot areas with commercially valuable concentrations of NTNRs. The average distances traveled by collectors vary between 5 and 25 kilometers. The remote areas for high mountain bilberry species are the most distant, and are located on the hide ridge of the Park section close to 2000 meters.

Prior to the establishment of National Parks, the local State Forestry Units issued permits for all non-timber natural resources collection. Investigations indicate that these permits are not based on concrete data for the use of medicinal plants.

There are no records of permits being issued by Municipal authorities over the last 10 years, despite this being an licensing option in the Medicinal Plants Act.

The National Park Directorate has been issuing permits since 1999. In this same year, commercial licensing for the collection of medicinal plants was allowed. Rather than issuing individual permits for commercial quantities, Parks could enter into commercial contracts with firms and buyers for specified collection quantities.

Below are the records of commercial licenses and quantities issued by Central Balkan National Park during 1999.

Company	Amount in Tons	Product
1. Elsner Product, Varshets	1 & 9	cowberry & bilberry and bog whortleberry
2. Neri & Aziago, Dobrich	10 &14	cowberry & bilberry
3. Plama'96	2	bilberry
4. TET-S, Teteven	2	bilberry
5. AKK-55 SP., Vassil Levski	0.05	bilberry
6. RUSSI Ltd., Parvenets	1.8	bilberry and bog whortleberry
7. Adana, Plovdiv	10	bilberry and bog whortleberry
8. Merlini & Danimond, Sofia	2	bilberry and bog whortleberry
Total	**11**	**cowberry**
	40.85	**bilberry/ bog whortleberry**

10 tons of cowberry and 39.5 tons of bilberry and bog whortleberry (these two fruits are combined for when quantifying the resource) are permitted for collection from this Park Section. Amounts were over-harvested in the case of bilberry and bog whortleberry, by 1.35 tons. This collection represents a total permit revenue from these berries of 6,045 BGL, at the rate of 0.15 BGL/kg.

N.B. These collection figures do not include berries that were harvested for personal use.

In the year 2000, the Medicinal Plants Act came into effect. Permits were now issued to individuals. The number of permits issued for bilberries and cow berries was 118. Quantities specified under those permits totaled 17,880 tons, or 225 % less than the previous year. As 2000 was a drought year, part of the decrease in harvest can be explained by poor growing conditions.

Tariff fees amounting to BGL 2 681 (BGL 0,15/kg for the same berry species) were generated.

In the same year, permits for the collection of:

nettle (500 kg),
stems of wild thyme (80 kg),
stems of mouse-ear hawkweed (80 kg),
stems of eyebright (80 kg) and
win savory (200 kg)

have been issued. The tariff fees generated by these 940 kgs, was BGL 20.

The collection of herbs and mushrooms for commercial use is a traditional activity in the region. These natural resources are basic income-resources for a great part of the local people, mainly unemployed and with Roma origin. Group collection is practiced for the following species: bilberry and cowberry, all-good, raspberry, blackberry, cep, dog rose, St John's wort etc. The buyers organize the group harvest. They direct the collectors to certain areas, organize their transportation and stay in the region, the food and establishment of temporary camps. The transportation is by trucks or passenger cars to certain Park areas and on foot to the concrete places. There is individual collection of certain herbs like mantle, wild thyme, wild marjoram (*Origanum majorana*). The purchase is done in 5 buyers' stations

3.2.5. Local Supply Chain Dynamics

Resource Potential

The following medical plants are identified and collected from the Park Section, by local collectors and buyers. The quantities are estimates, and are not supported by accurate record keeping. These species and their quantities were reported by the surveys of 2001, conducted by the National Park Directorate for Central Balkan.

Win savory (*Satureja pilosa*) –	1 t stems
Mistletoe (*Viscum album*) –	2t stems
Yarrow (*Achillea millefolium complex*) –	1t – stems
Silver birch (*Betula pendula*) –	1t leaves
Hart's-tongue fern (*Phylitis scolopendrium*) –	with severe restrictions
Tansy (*Tanacetum vulgare*) –	50t stems
Wild angelica (*Angelica sylvestris*) -	1t roots
Wild strawberry (*Fragaria vesca*) –	8t max.– fruit
Restharrow (*Ononis spinosa*) –	1t max.– roots
Cornell tree (*Cornus mass*) –	10t max. – fruit
Alder (*Frangula alnus*) –	500kg – rinds
Yellow galium (*Galium verum*) –	2-3t – stems
St Johan's wort (*Hypericum perforatum/H. maculatum*) –	50t max.–stems
Icelandic lichen (Cetraria islandica) –	1t
Wild apple (*Malus sylvestris*) –	4t – fruit
Stinging netle (*Urtica dioca*) –	1t max. – roots, leaves
Hellebore (*Helleborus odorus*) –	2t – roots
Blackberry (*Rubus spp.diversa*) –	2-3t fruit
Cowslip (*Primula veris*) –	06-07 t – blossom
Common lung-wort (*Pulmonaria officinalis*) –	1t - leaves
Lime-tree (*Tilia argentea & t. plathyfillos*) –	1t – blossom
Great mullein (*Verbascum densiflorum*) –	1t – leaves; blossom-limited
Banewort (*Atropa bella-donna*) –	2t – leaves; 5t – roots
Raspberry (*Rubus idaeus*) –	10t max.– fruit; 2t – leaves
Thyme (*Thymus spp. diversa*) –	04-05kg – stems
Bearberry (*Arctostaphyllos uva-ursi*) -	40-50kg – leaves
Mouse-ear hawkweed (*Hieracium pilosella*) –	1t – stems
Cranesbill (*Geranium macrorhizum*) –	up to10t – stems
Hazelbush (*Corylus avellana*) –	1t – rinds
Eyebright (*Euphrasia officionalis*) –	up to 1t – stems
Mountain ash (*Sorbus aucuparia*) –	0,5t max.– fruit
Juniper (*Juniperus communis/J. sibirica*) –	up to20t – fruit
Wild marjoram (*Origanum vulgare*) –	up to1t – stems
Orchids (*Orchis spp. diversa*) –	limited quantities – bulbs
Blue gentian (*Gentiana asclepiadea*) -	limited quantities – stems
Common mallow (*Malva sylvestris*) –	2t – leaves
Redthorn (*Grataegus monogyna*) –	up to 1t – fruit

Cowberry (*Vaccinum vitis idaea*) –	up to10t – fruit
Red germander (*Teucrium chamaedrys*) –	1t – stems
Elder (*Sambucus nigra*) –	up to 0,5t fruit, up to 0,8t blossom
Bilberry (*Vaccinum myrtillus*) –	40t – fruit
All-good (*Chenopodium bonus – henricus*) –	up to1t - roots
Mantle (*Alchemilla vulgaris complex*) –	0,3t – stems
Dog-rose (*Rosa spp. diversa*) –	up to15t - fruit

Edible mushrooms:

Cep (*Boletus spp.*) –	30t max.
Brown ring boletus (*Suillus luteus*) –	up to 5t
Tinder (*Albatrellus ovinus*) –	up to 0,5t
Chanterelle (*Cantharellus cibarius*) –	up to 24t
Morel (*Morchella esculenta*) –	2t max., rarely
Scaled prickle fungus/hydnum (*Sarcodon imbricatum*) –	up to1t
Parasol mushroom (*Macrolepiota procera*) –	up to 0,2kg
Agaric (*Marasmius oreades*) –	5t

Local Processing Facilities and Wholesalers

There are 5 buyers' stations in the area. They are in the following places:

Klisura – 1;
Rozino village – 2;
Hristo Danovo village – 2.

Three stations are managed by individuals (Vesselin Milov, Shevket Bobev and Stoycho Atanasov), and the other two – by small companies (Angel Sheitanov and Nikolai Nikolov). All buyers, except Angel Sheitanov, are local people. Only two stations (those of Shevket Bobev and Angel Sheitanov) are registered in the RIEW - Plovdiv.

During annual collection campaigns, buyers do open temporary purchasing stations in the pilot area communities. In the case of collection campaigns for blueberries, ceps, etc, we have witnessed middlemen opening illegal buying stations.

Most buyout points include basic facilities offering some form of storage. Facilities are private property, and belong to the buyers. Buying stations are equipped with equipment for purchasing and some basic processing.

The buying station of Stoicho Atanasov is significantly larger and with a greater capacity than his competitors. He however, prefers to focus on the purchase of wild products that require minimal processing (sorting and washing only) and daily, refrigerated transport. His opportunities for herb collection and storage are limited by his capacity to dry and bale herbs.

Three of the buying stations posses dryers, but have all limited capacity.

Buyers in the region work with commercial variety of about 30 herb species and 7-8 mushroom species. There is no data for the exact quantities bought up and processed during the different years. Working with bigger tone capacity is preferred to the variety of species. One of the stations prepares a wider range of herbs for the home market. Complaints for bad condition often occur, due to incorrect collection or damaged herbs and mushrooms. The coordination between the buyers for concurrent start of the campaign collection of wild berries is always a problem in the area. As a result a great quantities of green fruits are picked and this leads to quality disgrace and conflicts. The terms for preparing the basic stations in the area are relevantly July-August for bilberries and June and September-October for cep. There is no data for official collection of medical plants that are under restrictive regime for use. The buyers work with the established assortment for years, as they retain from introducing new commercial posts. The basic part (up to 90%) of the bought production is exported. Negotiating the prices is based on loose principle, as the better offers are preferred, no matter of the realization. There is no concrete data for the trade partners, but each buyer works with 2-3 bigger companies and with different number of middlemen. The activity of purchasing is a family business for all buyers, as in the different stages of the work the members of their families may participate actively. Shevket Bobev has the biggest work experience in this sphere, working as a buyer in the Consumers Co-operation since 1952 and has passed qualification courses in herbs- and mushrooms production in the system of the CCU. The other buyers have worked for 9-10 years and have acquired skills through their experience.

The buyers in this area work in compliance with the quality requirements defined by the clients or by presenting samples of the ready production. The trade batches are formed in the store bases of the bigger companies and very rarely in the purchasing stations.

There are no local companies that deal with modern processing of medical plants, wild berries and mushrooms.

Biohit company in Karlovo is packing table tea, by using imported resources from the Czech company Biogena. The same company exports herbs for the Czech market, but does not work with local buyers – it prefers to deliver batches for export from other regions of the country.

Local Buyers

Angel Sheitanov, Vessela Sheitanova SP, Benkovski village, tel: 0318 82771 (home and fax)
Nikolai Nikolov – ROK-90 SP., Rozino village
Stoycho Atanasov – herbs-buyer, Hristo Danovo village
Shevket Bobev – herbs-buyer, Rozino village

Local brokers

Vesselin Stefanov Milov – broker, works for Fungo Robika Ltd., Chepelare, 43 April 20th St., tel: 2436

3.2.6. Vaccinium Species

Bilberries *(Vaccinum myrtillus).* and the cowberries *(Vaccinum vitis idaea)* are traditionally harvested for commercial use. They are profitable and preferred resource for the local collectors Park Section Klisura is known for its good reserves, as both the exposure of the territory and its microclimatic factors favorably influence berry production.

Purchasing of larger quantities of *Vaccinium spp.*, increased significantly in 1995, when Neri and Azigo Company took an active role in these resources. This company has favorable positions in the national trade of *Vaccinium spp*. There is an absence of precise information concerning the quantities of *Vaccinium spp*. on the territory of this Park Section, the National Park, and the territory surrounding it. But observations and experience in the region indicate that the predominant source of *Vaccinium spp*., is from the National Park, with a significant amounts collected from Klisura Park Section.

Stoycho Atanasov, as a main broker in the region for Neri and Azigo Company, buys most of his commercial quantities at his buyout station in Hristo Danovo. Daily harvests of berries are stored here in a refrigerator truck, provided by N&A Company, and at the height of the berry collection campaign are transported daily to Pazardjik, where they are washed and frozen for export.

The frozen fruit is exported to Rigoni di Aziago Company, in Italy.

Approximately, 40 – 50 t of fruit pass annually through the station of Stoycho Atanassov when there is a good crop.

The scale of personal use in this region differs significantly from the one in the outskirts of Rila National Park. There are no traditions of personal use and conserving fruits for the winter in this region. This is an issue of family culture and type of livelihood. The quantity which can be calculated in addition to the commercially collected bilberries does not exceed 5 tons, which would allow us to make the estimation for about between 50 and 60 tons annual collection from this Park Section.

The buying price per kilogram for bilberries (*Vaccinium myrtillus*) during the 2001 collection season averaged BGL 1.80, while in the past years it has reached BGL 2.20-2.80.

3.2.7. Cultivation of Non-Timber Natural Resources (Medicinal Plants) in the Pilot Region

The area has suitable climatic and soil conditions for cultivation of medical and ethereal oil-producing plants. Cultivated crops of medicinal plants from the region include: Damask rose (*Rosa damascena*), peppermint (*Mentha piperita*), water plantain (*Lavandula angustifolia*), valerian (*Valeriana officinalis*), garden tea (*Salvia officinalis*), balm (*Melissa officinalis*), basil (*Ocimum basilicum*), milk thistle (*Silybum marianum*) and others.

There is a century of experience and tradition in medicinal plant cultivation in the area.

There is still a regular demand for and production of *Rosa damascena, Mentha piperita, Lavandula angustifolia, Valeriana officinalis.* International market trends suggest the demand for these cultivated medicinal plants and oils is again growing. In addition, there is a growing interest if certified, organic cultivation of these resources from the area.

Medicinal plant cultivation is primarily conducted by private businesses (usually extended family units), or through cooperatives. Cultivation occurs on private land, or parcels rented from the municipality.

Market economics are such that quantities are dictated in advance, and contractors are used to fill quotas. Advance payments are often made prior to harvest, and companies regularly provide seed stock and sowing services.

The Institute for Roses and Ethereal Cultures, in Kazanluk, provides guaranteed seed stocks.

The main problem with the cultivation of medical and fragrant plants is that production is not purchase-and realization ensured. There is a dropping-behind and expiration of the herbs, which after a definite period become unfit for sale. This leads to producers' disappointment and loss of economic interest.

4. Threats and Constraints

Medicinal plants and mushrooms are considered an important part of this country's biodiversity, if only because they are an important indicator of plant diversity, and such a significant component of Bulgaria's heritage and protected area's resources. If we ignore their importance to the discussion of biodiversity conservation, we do so at our peril, because they are already a significant, renewable natural resource.

An analysis of the NTNR sector at national level, national legislation, and a review of threats and constraints operating at local levels is shared below. Within the context of this set of pilot projects, and for the objectives of this study it is necessary to agree on those that are most significant and to agree on a plan of action for tackling them.

4.1. Improper Collection

Is a threat. When collectors are unfamiliar with the correct, environmentally sound techniques, the result is the destruction of both individual species and population concentrations. This threat is demonstrated clearly in the case where collection of whole plants for the stems, leaves, flowers or berries, and the extraction of macromycetes, involving damage to mycelia, occurs. To often the collector act in the most expedient way ("the easiest way") and after collecting, dispense with the parts they do not need, taking only the needed part of the plant, herb or mushroom to the purchasing station.

Typical examples of improper collection associated with both species and entire populations related to: the extraction f St. John's wort, bear berry, yarrow, wild marjoram, bilberries and cowberries, felling of linden trees for the collection of their blossoms, etc.

While there is a regulation (pending) that will govern the collection of medicinal plants and mushrooms, the most effective manner for improper collection is a combination of law enforcement, education, and spot checks that work with buyers to discourage the practice. This is a much about collection ethics, as it is about expediency.

4.2. Premature Collection

Premature collection is a threat, in that collection that occurs too early can affect the reproduction and viability of species and populations to reproduce to best effect. Premature collection can also affect the potency and viability of the final product when dried. This is particularly pertinent for herbs. Premature collection can result in a dried product that does not meet commercial and/or pharmaceutical standards.

The fact that contributes most to premature collection is the competition between buyers and middlemen, as well as the lack of effective and timely negotiations at the beginning of the

collection campaign. Competition for the same resource can drive collectors to premature collection, as they fear someone else will harvest before they do. If premature collection behavior is rewarded with sufficient sales of a commodity, then it is perpetuated. In many cases, there has been a lag in the effective coordination between all participants in the supply chain. Eventually poor quality and premature collection of fresh fruits and mushrooms is rewarded with no sale, and results in huge quantities plant and mushroom waste. There are many examples of financial losses for the collectors and the buyers who do not keep proper collection standards.

There are three simple recommendations that help to encourage improved supply chain dynamics. The first is that the National Park Directorate is in the best position to declare a collection season open for resources under its management. This can be achieved in conjunction with collectors, buyers and communities. Second, a simple permit system can be employed for all collection, irrespective of the quantities harvested. Third – to better coordinate with the buyers when they will accept ripe fruits and herbs to standards that are acceptable all the way down the supply chain.

Mushrooms, in all instances, are a bit more difficult to address in this manner, and there is little opportunity to predict collection period or quantities, or quality. The wild mushroom is highly capricious, and is better served by an education campaign and better coordination with buyers.

4.3. Collection in Reserves or Prohibited Zones

This is a constant and historical threat. Illegal collection is either deliberate or involuntary. The irony is that populations of wild medicinal plants tend to be better in reserves because they are subject to little or no collection. There are few studies proving conclusively that harvesting is better than protection for perpetuating populations of wild medicinal plants, and vice-versa. There are however, those collectors that believe that wild resources from reserves are of superior quality, and will trespass to collect them.

There is also an involuntary collection of herbs, wild fruits and mushrooms in the reserves and the prohibited zones. This is primarily due to lack of knowledge about the boundaries of these areas and the absence of distinct markings and information signs.

4.4. Collection of Species Protected by Law

Market demand drives illegal collection of those species that are protected by law. Those species that are protected because of national, regional or international conservation significant, and those that are protected with a protected under a “special regime of use”, are often the victims of poaching.

These species include: yellow gentian and dotted-flowered gentian, lady's mantle, rose-root, hart's-tongue fern, water clover, etc., whose population levels are below the critical minimum, but are of great demand on the home and foreign markets.

There is a prohibition on collection of species under special regimes for commercial use, in the National Parks since 2001. This means that these species cannot be subject to commercial quantities of collection. Their personal collection is allowed.

Without proper law enforcement and monitoring, personal collection easily becomes commercial collection. Frequently, ignorance is pleaded as a defense in the face of the law. In some instances this ignorance is justified; in most cases not.

4.5. Imperfect Legislation

The absence of effective secondary legislation is considered the most significant drawback to proper implementation of the MPA. There are some 10 secondary regulations that wait to be developed, approved and implemented.

The most significant among these are:

A regulation for the rules and requirements of Herb Collection

The Medicinal Plants Act requires the development of the Regulation for Herb Collection. This regulation is aimed at unifying the technologies and methods for collecting the useable portion of each medicinal plant. It's believed that this regulation will provide more appropriate guidelines in support of medicinal plant reproduction and conservation, and help to improve population viability. The most important aspect of this regulation is that it is best developed and designed in conjunction with collectors, buyers and the scientific community.

In the case of National Parks, these standards and methods can be developed with the assistance of Park guards who are eventually responsible for implementation of this regulation.

In the absence of this regulation, "permitted collection" refers only to general rules of behavior in the Park, which could be kept by the collectors.

Methodology for monitoring and evaluation of the medical plants populations

The absence of an approved, nationally applicable methodology for the evaluation of medical plant populations is considered a significant draw back to long-term population monitoring and conservation management. A standardized assessment is one of the most important pre-requisites for the sustainable management of the natural resources.

The first attempts to standardize the assessment and the use of non-timber resources (fruits of cowberry and bilberry) are from 1999, from work done in Central Balkan and Rila National

Parks. The management plants reflect these ideas. This methodology was again applied in a more comprehensive assessment of the *Vaccinium spp*. resources in the two Park pilot areas. That report is the subject of Volume II of this series.

A national, practical methodology for a NTNR resource assessment methodology and approach as a step in the sustainable management of the non-timber resources, is expected within the next months. As information for the localization and the state of most non-timber natural resources is extremely limited, it is essential to employ the methodology and approach so successfully used in the National Parks, for other Park Sections and other NTNR populations in the country – otherwise a sustainable NTNR harvesting program will clearly be impossible.

In addition, there are some unclear, irrelevant and poorly designed legislative requirements, which do not promote sustainable management and effective, operational management control of the resources. Typical examples for this are: permit procedures, a consistent system of fees for permits issued by each Ministry and management authority, and BETWEEN Ministries, and management authorities.

4.6. Differentiation Between Personal and Commercial Use

At present there is little incentive and few opportunities to distinguish between non-timber natural resources collected for personal or commercial use. The present system is designed to encourage commercial collection by local collectors, and to make collectors accountable for each kilogram of resource that they collect. While the idea is correct, the permit system is flawed because of the ease with which permits can be obtained from different authorities to cover any “non-commercial” or “unaccounted” quantities of medicinal plants collected.

In the example of *Vaccinium spp*., the commercial daily amounts are 10 kg or more; the personal collection amounts per person, per day, are 10 kg or less. Park Guards carry no scales, and can only ask if amounts are covered by permit.

In addition, the buyers most often advance individuals or families of collectors for the commercial quantity of berries that they want collected. Their pre-season “deals” can be substantial. They require trust of the part of the buyer that the collector will return each day to sell their berries to him/her, and that the price will be fairly negotiated for both parties.

Present commercial and personal collection permits do nothing to “manage” the resource, and are an ineffective tool for monitoring resource consumption. The present use of permits only allows for partial monitoring of the commercial consumption of berries, and there is NO system for monitoring personal consumption. When National Parks set a quota on the amount of resource that can be harvested, they presently have no way of monitoring when that quota has been reached. This appears to defeat the use of a permit system.

4.7. Costs of Present Permit System

The direct administrative costs of the National Parks permit system are far greater than the funds which are raised through the sales of permits for commercial collection. If a Park manager adds the indirect costs of law enforcement and monitoring, then the costs of administering the system again far outweigh the financial benefits accruing to National Parks. The present system is also not an effective way of moderating and monitoring resource harvesting.

In addition, any administrative delays in administering the permit system, reviewing applications, collecting fees, and returning these permits to the appropriate applicants can adversely affect the timely collection of resources. This is a critical issue from the buyers' perspective.

4.8. Degradation of the Habitats

Campaign-type collection of non-timber resources is the most significant physical threat to the populations and habitats of large scale quantities of: blueberries, St. John's wort, cep (squirrel's bread), brown ring boletus, and others medicinal plants. Often there are too many vehicles and people present in the Park during such campaigns. Campaign-type collection results in localized habitat destruction, pollution with household and human waste, fires, and excessive noise. Groups of collectors can camp illegally on the territory of the Park and without keeping to basic Park rules. This type of behavior is diminishing however, with most collectors returning home each night.

Sometimes purchasing stations will move to the Park territory to allow for more immediate access, and greater quantities to be harvested. Prior to the new legislation, and emphasis on local collection permits, this was a typical phenomenon in the Central Balkan National Park in the area of Beklemeto during the campaign for the collection of St. John's wort in 1997 and 1998.

5. Conclusion

Central Balkan and Rila National Parks were only declared ten years ago; the third, Pirin, was declared some three decades ago. While a Bulgarian tradition of wild resource collection has probably existed for at least 4,000 years, it is only recently that many of these resources have been protected as part of Bulgaria's rich biodiversity heritage. While sustainable wild resource collection has been practiced in Bulgaria, it is only recently that both the Protected Areas Act, and the Medicinal Plants Act, are actually aimed at wild resource conservation. This enlightened policy was constructed during the development of Europe's, and Bulgaria's, first National Strategy for the Conservation of Biological Diversity. Important parts of the strategy have been realized during successive years. The first practical protection for wild, non-timber resource management is found within National Parks.

It is therefore, only logical to view sustainable wild resource harvesting in the light of past practice and existing dependence. This situation analysis goes a long way to highlighting the importance of medicinal plants in our National Parks as part of biodiversity conservation, and sustainable resource management, as well as local livelihood dependence.

The following general conclusions can be made in summary to the end of this first volume. Because of their location and size, National Parks play a significant role in the protection and conservation of non-timber natural resources, or medicinal plants. In addition, present policy practices perpetuate a practice that has been enjoyed by Bulgarians for centuries, to lesser or greater degrees. NTNR access and harvesting continues to figure prominently as both a source of subsistence livelihoods and income generation. With economic restructuring, and the move to a market economy experienced in the 90's, there is actually a growing dependence on non-timber natural resource collection as a livelihood strategy, as well as a source of household income. This trend is increasing in the face of growing unemployment, state enterprise restructuring, and a greater dependence of a cash economy. If anything, we can assume that this trend will continue in areas of high unemployment, and in areas with higher percentages of ethnic minorities than is the national norm. Greater dependence on wild resources and medicinal plants as a source of annual income could mean that collection pressure on resources could increase. Collection could become less organized and more chaotic than is presently the case. Local, non-timber natural resource "tenure" - traditional resource access and harvesting rights could be lost in the face of increasing commercial pressure (demand), with more people entering the supply chain without previous knowledge or experience. Increased competition for resource access will undermine both the local, collaborative management approach, and could jeopardize the status and health of wild resource populations.

With a strong legislative framework and new, dynamic Park management authorities, now is the time to strengthen our program of medicinal plant management locally, with communities whose livelihood is still closely linked with sustainable wild resource management practices. If we are able to a capitalize on this traditional relationship between communities, collectors and resource, Parks will pioneer a system of sustainable resource management that will set important precedents for Bulgaria as it takes steps to join the Paneuropean ecological network - Natura 2000, and the EU.

Non-Timber Natural Resources and National Parks

PART 2

Vaccinium spp. Resources Assessment in the Pilot Areas

Summary

The resources of two *Vaccinium* species (*Vaccinium myrtillus L.*) - bilberries - and *Vac. vitis-idaea L.* –cowberries - have been evaluated in two pilot regions, one in each of Rila and Central Balkan National Parks, applying the principles of collaborative management. Scientists, National Park staff, and local community resource collectors joined in teams with the coordination of the BCEG Project, to assess these resources during the month of August 2001. The distributions of *Vaccinium* species in the pilot areas, the status of their populations, and the exploitable resources, have been evaluated. In addition, existing threats and human impact were examined. Information has also been collected on the dependence of wildlife on the *Vaccinium* plants.

The results show that the fruit yield and the distribution of both *Vaccinium* species (included under the designation of medicinal plants in Bulgaria) depend mainly on the specific meteorological and ecological conditions in their habitats. The status of the populations of the bilberry and cowberry is good in the pilot areas, and no serious damages in the population structure exist. Based on this assessment, specific recommendations are given for continuing the sustainable use of these resources on both a commercial and personal basis.

This Part of the Report is presented as a summary of field work conducted in the two National Park pilot areas. The report presents both the context of the wild resources assessment, and the approach of collaborative management. It explains the methodology and materials used in the assessment. Finally, it presents the results of the evaluation, more specifically, from each of the pilot areas.

Introduction

i. Context

The BCEG Project is implementing a series of pilot projects linked to the protection and sustainable use of natural resources and sites within Rila and Central Balkan National Parks. These pilot efforts are funded by the United States Agency for International Development (USAID), and implemented by Associates in Rural Development (ARD) under the Biodiversity Conservation and Economic Growth Project.

One of the pilot projects addresses the sustainable management and collection of non-timber natural resources (NTNRs) from within National Parks and aims at application of the principles of collaborative management. The implementation of the pilot program in both Parks complies with the objectives stated in the management plans of the National Parks (2001-2010). Both plans aim to conserve and maintain the natural condition and biological potential of the medicinal plants, wild fruits and mushrooms. In addition, the Parks attempt to create a suitable environment for sharing the responsibilities and benefits arising from the use of natural resources between the Parks and the local communities. Ultimately, these efforts aim at providing local resource gatherers with an environmentally sound livelihood, and economic growth opportunities.

What is the Collaborative Management of Non-Timber Natural Resources?

The Rila and Central Balkan National Park Directorates are attempting to implement a program for non-timber natural resource conservation and management in their Parks, together with the local partners. These partnerships are focused on communities that are found in close proximity to the Parks. This experimental program is called "collaborative management". It supports a sustainable natural resource conservation approach that includes the following elements:

- Identifies the groups (formal and informal) of local natural resource collectors;
- Identifies the populations of significant (from conservation and economical point of view) natural resources;
- Determines the area where collectors may work;
- Determines the regimes, norms and methods of collection;
- Develops and uses a plan for monitoring what, when and where is collected;
- Determines the responsibilities of each of the partners in elements of training, advertising, funding, control, supporting technologies, etc.;
- Identifies a method for resolving possible conflicts.

Criteria for Pilot Project Area Selection

Both Parks employed a set of criteria to determine the areas that would serve as pilot areas for this collaborative management of non-timber natural resources. These pilot areas would be developed as models, and based on the success and failures of these models, would be expanded to the entire National Park territory as appropriate. The preliminary criteria used by the two Parks include:

- Proximity to and dependence of local communities on resources found within the National Park boundaries;
- Regions where each Park's Management Plans has regimes that allow for commercial collection of natural products;
- Areas where the non-timber natural resource were available in sufficient quantities to support commercial extraction;
- Receptivity of local governments to partnership opportunities linking natural resource conservation and collection to the National Parks;
- High percentage of disadvantaged and minority communities dependent on seasonal collection of natural resources from within each of the two Parks;
- Existing traditional practices and infrastructure for collection and trade.

These criteria were applied to both National Parks, with the resulting selection of the Klisura pilot area for Central Balkan National Park and Yakorouda and Belitsa pilot area of Rila National Park.

Criteria for Selection of a Pilot Non-Timber Natural Resource for Application of the Collaborative Management Principles

The result of the situation analysis (Part 1. Situation Analysis of the Status of NTNRs and Bulgarian National Parks – Opportunities for Collaborative Management) in the National Parks' pilot areas shows that the idea of collaborative management could be best accomplished with the selection of a non-timber natural resource with the following characteristics:

- Can be addressed as a resource that qualifies for sustainable use, according to the Medicinal Plants Act, the Park Management Plans, etc.;
- Can be subjected to a seasonal inventory using a commonly available and widely applied methodology;
- The resource should have a history of personal and commercial collection;
- The resource should be largely located within the National Park. This will reduce management and control conflicts with surrounding State Forestry Units;
- There should be an existing demand for the resource, and an established supply chain;
- The resource should be sufficiently attractive as a source of income;
- The resource should be widely recognized by collectors.

Both types of berries – bilberry (*Vaccinium myrtillus L.*) and cowberry (*Vaccinium vitis-idaea L.*) are considered priority species and meet all the above mentioned conditions**.**

Vaccinium resources, as natural resources mainly located in the pilot regions are suitable for the application of the major principles of collaborative management. Current resource evaluation aims to apply these principles and for first time in Bulgaria to include into the resource evaluation process not only scientists and Park staff, but also collectors of natural products from the adjacent areas.

For the conservation and sustainable use of the medicinal plants article 50 of the Medicinal Plants Act (MPA) provides for the development of medicinal plants resources management plans as a separate plans that supplements National Parks management plans. Each medicinal plants resources management plan should give specific information on the localities of the medicinal plants species, the amount and condition of specific resources (both conservation and commercially viable species) as well as their population status. Each plan should offer prescriptions for specific resources protection and sustainable use.

The MPA also requires monitoring system to be established for long-term observation of the status and the exploitation of resources of medicinal plants. Each monitoring system should be designed to recognize negative processes affecting medicinal plant resources, to prognosticate population development, and to identify suitable measures to mitigate or prevent deterioration.

To help the monitoring, a cadastre of the medicinal plants must be established countrywide (Art. 57, MPA). The cadastre is a registry designed to maintain data about location, areas, and boundaries of medicinal plant populations. Databases should contain information on condition of the populations, amount of each medicinal plant resource available, as well as their annual level of use. The Parks' Directorates are required to maintain the medicinal plant cadastre for the National Park territories.

Using the provisions and requirements found in the MPA, the cowberry and bilberry are selected as priority species for resource assessments and the development of plans for management of their resources in the two Parks. *Vaccinium* plants resource requires particular attention by National Park Directorates (NPD) concerning their management, protection and control as a resource with a great demand concentrated mainly in the Parks` territory. The resource evaluation is a necessary step to determine *Vaccinium* fruit amounts and their locations. The resource evaluation is then used by each NPD as the basis for issuing collection permits in each successive year.

A resource assessment of *Vaccinium spp*. will help to create a model for assessing these as well as additional non-timber natural resources. The strategy for the conduct of these resources assessments is to include specialists alongside Park staff and local resource gatherers for every assessment. This is perhaps the most important departure from the way that many resource assessments are conducted. The premise for this strategy is a simple one. If we engage Park staff and local resource gatherers as partners in the assessment process, then there is a much better chance that the methodology and the results will be understandable and applicable to local audiences. Both methodologies and recommendations will have a much better chance of being adopted and applied.

The bilberries and cowberries resource assessment and the evaluation of the state of their populations also provides important base line information as part of a Park long-term ecological monitoring of the ecosystems that include these species. The populations of *Vaccinium spp.* can be considered an indicator and element of habitats of high conservation value – subalpine and alpine shrub and herbaceous associations in Central Balkan National Park, and in coniferous forest associations of *Pinus sylvestris*, *P. peuce* and *Picea abies* in Rila National Park.

ii. Objectives of the *Vaccinium spp*. Resource Assessment

The objectives of the resource assessment are to determine the distribution of two species of berries, *Vaccinium mirtyllus and V. vitis idaea* in three Park pilot regions – (one for Central Balkan National Park, in Klisura Park Section, and two for Rila National Park, in Yakorouda and Belitsa Park Sections). In addition, the resource assessment is used to determine, the sustainable harvest for *Vaccinium* resources of the economically significant localities, and to study the populations' condition as a baseline information for monitoring. Based on this assessment, specific recommendations are given for the sustainable use of the resource.

iii. Materials and Methodology

"Methodology for Determination of Medicinal Plants Resources" (1986) was used in the assessment of the *Vaccinium* resources. This methodology has been used successfully in similar studies assigned by the Ministry of Environment and Waters[1]. Map sheets (scale 1:25000) were used. These were prepared with the help of the GIS databases for the two Parks (See Appendix 2-B). Additional materials included: electronic scales (1gr precision and maximum load 2 kg), measuring tapes (30m length), wooden square frame covering an area of 0.25 m^2 with a grid of strings, paper and plastic bags, and labels.

The resource assessment has been carried out in regions of the Park Sections with economically important *Vaccinium* localities. This information was gathered from local fruit collectors and Park rangers. The criteria considered in the selection of these localities included: traditional use of these sites for commercial collection of berries, easy access, and, with less importance, available scientific information.

[1] The methodology was adopted by the USSR State Committee for National Forestry in 1986. It has been used in Bulgaria for the purpose of medicinal plants resources evaluation on different occasions, including: MoEW: "Resource Investigation of Medicinal Plants Under Protective Management Regime for the Purposes of Determination of Scientifically Based Norms of Their Use" (1993-1995); BNSF B-436: "Distribution, Population Status and Resource Characteristic of Medicinal Plants in the Znepole Floristic Region" (1994-1997); studies conducted during BSBCP project on "High Mountain Treeless Zone of Central Balkan National Park" (1995 - 1997); GEF Bulgarian Biodiversity Conservation Project (1997-1998).

Control areas and projective cover of *Vaccinium* species within these areas, have been used to calculate the fruit yield. Depending on the relief and the total area of the localities, control areas of 400-1000 m^2 were established. The projective cover and fruit yield of the studied species have been calculated from systematically established sample plots with an area of 1 m^2 or 0.25 m^2. The number of the sample plots was determined in accordance with the statistical requirements for reliability and exactness as given in the methodology. The fruit yield per unit area (kg/ha) and the exploitable resources are calculated accordingly as well. Each control area is identified, numbered and mapped, and the altitude, exposure, slope, and the dominant species of the plant communities are recorded in a field book. A description of existing threats and human impacts on the *Vaccinium* populations are included in the description of every control area. Finally, on each map we included the area and locations that were investigated.

iv. Time Schedule of the Resource Assessment, Studied Territories and Participants

The field studies lasted 12 days, 6 days per each Park.

03.08.2001 - 09.08.2001 in Klisura PS
09.08.2001 -15.08.2001 in Yakoruda PS and Belitsa PS

Klisura PS is the southwestern administrative section of the Central Balkan National Park. This is a southern watershed area of approximately 12-13,000 hectares, supporting the rural communities of Klisura, Rozino, Christo Danovo, Kurnare and Iganovo. This Park Section is the pilot area for Central Balkan National Park's pilot eco-enterprise program for the collaborative management of non-timber natural resources.

Yakoruda and Belitsa Park Sections are the southern Park administrative sections of Rila National Park. This is a southern watershed area of approximately 20,000 hectares, supporting the rural communities of Yundola, Cherna Mesta, Yakoruda, Belitsa, Dolno Draglishte, Gorno Draglishte, Dorbursko. These two Park sections form the Park's pilot eco-enterprise program area.

The field team for both Parks consisting of 24 people. These included experts from Bulgarian Academy of Sciences (BAS) and the BCEG Project, technical specialists and rangers from relevant National Parks, and local collectors of non-timber natural resources (wild *Vaccinium* fruits). Each Park's field team comprises of a 10-12 people and was further divided into two working groups. Each working group consisted of a BAS resource expert, Park staff, and local fruit collectors.

Field Teams:

1. Klisura PS – Dr. Elena Genova, and Dr. Antonina Vitkova (Institute of Botany, BAS); Gergana Staneva, flora expert from NPD; eng. Marin Kostov, Park Section Head of Klisura PS and Vidol Furkov, Gyuro Cankov and Mircho Rajkov Park rangers; Asan Ibriam, Penka Pencheva and Mehmed Bobev, fruit collectors from the village of Rozino.

2. Yakoruda PS and Belitsa PS – Dr. Vladimir Valchev (Institute of botany, BAS); Dimitrina Boteva (biodiversity specialist on the BCEG project), eng. Rumen Kolchagov and Philip Zaikov, Park Section Head of Yakoruda PS, Atanas Asiov, Akia Manzurski, Usain Kutev, Ali Chitakov, Vladimir Kostov Park rangers, Aishe Salih, Salihe Borovin, Sabri Durleov and Vencislav Kozarev collectors from Cherna Mesta village and the town of Belitsa.

Fieldwork was conducted following an established plan and schedule. At the outset of each assessment, the methods and techniques were introduced to all participants of the field teams by the BAS specialists, assisted by the BCEG Project biodiversity specialist. Practical training using the methodology was accomplished in one day, and changes and adaptations to the schedule and methodology were discussed. The tasks for every participant in the field teams were assigned. These included: measuring the population parameters, field notes documentation, mapping of the *Vaccinium* localities, etc. On the basis of a rotation, all members of the teams took part in all steps and stages of the resource assessment, in both Parks.

1. Resource Assessment Results

1.1. Exploitable Resources Assessment of the Economically Important Localities

Klisura PS

The exploitation resources of bilberries and cowberries are determined in seven localities of commercial importance (Tables 1 and 2). The total area of all localities is 67.2 ha (1.3% of the whole area covered by *Vaccinium* associations in this Park Section). The size of the single localities varies from 1.2 to 20 ha. The mean projective cover of bilberry varies from 7.9 to 30.5%, while the fruit yield is from 0.73 to 53.60 kg/ha. The exploitable fruit resources for bilberry amounts to 397.7 kg.

The mean projective cover of cowberry is from 5.53-38.16%, the fruit yield varies from 0.15 to 7.50 kg/ha, and the exploitation resources of cowberry are calculated totally as 42 kg.

The exploitable fruit yields and the mean projective cover determined in the current study are decidedly different from the real ones because the assessment was conducted after the prime fruit collection was already completed. Potential annual fruit yield for 2001, therefore, cannot be calculated.

Table 1. Summary Data for the Localities of Bilberry (*Vaccinium myrtillus*) in Klisura PS

No	Locality	Area (ha)	Mean projective cover (%)	Fruit yield (kg/ha)	Exploitation fruit resources (kg)
1	Vartopa	20	7.9	0.73	14.54
2	Jumruka	6	19.3	10.43	62.60
3	Vetrovity preslap	10	30.5	15.34	153.00
4	Skoka	3	22.4	15.8	47.90
5	Beklemeto pass – the memorial	8	11.5	6.0	48.00
6	Beklemeto pass – Vodomera locality	19	12.6	0.39	7.40
7	Beklemeto pass – Kladenetsa locality	1.2	47.6	53.60	64.30
TOTAL		**67.2**			**397.7**

Table 2. Summary Data for the Localities of Cowberry (*Vaccinium vitis-idaea*) in Klisura PS

No	Locality	Area (ha)	Mean projective cover (%)	Fruit yield (kg/ha)	Exploitation resources (kg)
1	Vartopa	20	5.53	0.15	3.00
2	Jumruka	6	13.06	1.77	10.60
3	Vetrovity preslap	10	10.00	0.27	2.70
4	Skoka	3	-	-	-
5	Beklemeto pass – the memorial	8	10.58	0.15	1.18
6	Beklemeto pass – Vodomera locality	19	37.45	0.82	15.60
7	Beklemeto pass – Kladenetsa locality	1.2	38.16	7.50	9.00
TOTAL		**67.2**			**42**

The amounts, which are collected annually from the region according to information given by collectors and buyers realistically averages 50,000 – 60,000 kg per year (50-60 tons).

Belitsa and Yakoruda PS

Fourteen economically important localities of bilberry have been investigated. They cover a total area of 292.3 ha (Table 3), and the size of a single locality varies from 4.2 to 70 ha. The mean projective cover is from 15 to 55%, most frequently from 35 to 50% (in eight of the 14 studied control areas). The fruit yield varies from 5.04 to 108.9 kg/ha. The exploitable resources in both Park Sections are calculated as 17,264.7 kg. The amounts from a single locality vary between 33.26 to 5,469 kg. Despite the relatively large total area of the studied localities, the established exploitable resources are inaccurate as the basis for projecting average annual yields. The resource assessment was completed during and after the collection of *Vaccinium* fruits.

Table 3. Summary Data for the Localities of Bilberry (*Vaccinium myrtillus*) in Belitsa and Yakoruda PS

No	Locality	Area (ha)	Mean projective cover (%)	Fruit yield (kg/ha)	Prognosticated resources (kg)
1	Polenitsa	37.0	40.5	20.70	765.90
2	Dautitsa	6.7	19.0	10.72	71.82
3	Leevstitsa	4.2	28.0	43.97	184.67
4	Ropalitsa	12.0	40.0	108.9	1,306.80
5	Dzendemdere	2.0	31.0	57.66	115.32
6	Grantcharitsa	70.0	42.0	56.21	3,934.70
7	Vapata	40.0	43.0	74.25	2,970.00
8	Karaalanitsa	19.1	41.0	56.40	1,077.24
9	Kitkata	60.0	54.0	91.15	5,469.00
10	Tranlivetso	6.2	36.0	22.32	138.38
11	Galtchina katranitsa	7.2	55.0	44.15	317.88
12	Germanitsa	15.4	40.0	51.12	787.25
13	Vodev Tchutchur	6.6	15.0	5.04	33.26
14	Vadata	5.9	35.0	15.68	92.51
TOTAL		**292.3**			**17,264.7**

Information given by local buyers and collectors indicates that a minimum of 45-50,000 kg are collected from the region annually. In "good" years, annual yields are reported to reach 80,000 kg.

1.2. General Assessment of the Existing Threats and Human Impact

Some anthropogenic and climatic factors act as threats to the *Vaccinium* populations and their fruit productivity. Among the abiotic factors, we can include the abrupt climatic changes (frost, hale, late spring snowfalls, droughts, etc.) during flowering and fruit bearing as having the greatest effect.

Unfavorable for the *Vaccinium* populations are some of the natural succession processes, such as strong competition with *Juniperus sibirica* shrubs, which restore their ediphicator role and dominance over large areas in the treeless zone in Klisura PS. We can also note the natural restoration of *Pinus sylvestris* and *Pinus peuce* forests with increasing density of the trees in Belitsa and Yakoruda PS. The deep shade conditions, while protecting many of the *Vaccinium* plants from frosts, hail, and other adverse weather conditions, also retard berry production.

Important anthropogenic threats include fruit collection without regard for the ecological and biological requirements of the plant species (early collection of fruits before ripening, damages on the plants vegetative part), livestock grazing, and the construction of mountain infrastructure. In some regions, high concentrations of collectors on specific areas can be observed during fruit collection. Such large concentrations result in trampling of the *Vaccinium* shrubs and permanent establishment of paths deep in the *Vaccinium* patches.

The grazing of sheep, horses, and cattle are reflected in damage to the shrubs and intensification of the processes of destruction of the soil surface and ruderalization. The building and development of the local infrastructure (tourist complexes, buildings, roads, etc.) can also have negative impacts on the *Vaccinium* populations, particularly when no restoration of the local vegetation after construction is conducted.

The Rila National Park field team noted that although small areas of *Vaccinium* localities are located along the Belmeken-Sestrimo water diversion system - many formations of *Vaccinium* are seriously damaged along the derivation channel.

1.3. General Assessment of the Condition of the *Vaccinium spp.* Populations

Klisura PS

The status of the populations of cowberry and bilberry is good and no serious damages in the population structure were observed. Presently, no human activities have had strong impacts on the normal growth and fruiting of the *Vaccinium* plants. The meteorological conditions and phytocenotic relationships (successions of *Juniperus sibirica*) are the major factors for the

fruiting and distribution of *Vaccinium* populations. No serious phytopathogenic threats, except for attacks of an insect pest in one of the localities, have been registered.

The *Vaccinium* localities are accessible for commercial fruit collectors and are actively visited by them. Cattle and horse grazing has been detected in certain regions.

Belitsa and Yakoruda PS

The state of the populations of bilberry is relatively good. No drastic changes in their spatial structure were noted. Their phytosanitary state is very good. During the current assessment no pathogenic agents or any other damages due to pests was detected.

Consequences of unfavorable meteorological factors (hale) and anthropogenic impact (trampling during fruit collecting, and by livestock) have been detected. The field team registered a "positive" effect for the broadening and homogenization of *Vaccinium* populations resulting from forest clearing. Currently the fruit yield depends mainly on the specific ecological and meteorological conditions. The access to the localities for fruit collectors is relatively easy.

1.4. General Assessment of the *Vaccinium* Populations as an Economic Resource

The data about the *Vaccinium* populations received during the current study serve as a starting point for an economic resource assessment of these species.

According to the methodology for economic assessment of the resources of *Vaccinium* and other wild-fruits in the Moscow region in Russia, the criteria for an economically important locality are:

- the fruit yield to be not smaller than 300 kg/ha,
- the locality area to be not smaller than 1 ha and the distance between the locality and a main road or a purchase station to be not more than 5 km.

For the evaluation of a locality, important are also the exploitable resources and the economically valuable resource (this part of the exploitation resource that can be collected, processed and realized with the highest economic benefits). The economically valuable resource is directly proportional to the stage of development of the enterprise potential of the region and the related organization of purchase stations, transport, special equipment, etc. and to the accessibility of the region. The data about the exploitation resources of *Vaccinium* areas in the two Parks cannot be used directly in the calculation of the economically valuable resources because the *Vaccinium* localities have been evaluated after the prime fruit harvesting. The collected data can be used only to forecast the economic potential of the *Vaccinium* localities.

Klisura PS

The *Vaccinium* localities in Klisura PS are evaluated as economically important and perspective due to the characteristics of the studied area. The mean projective cover in the studied area of 67.2 ha is 7.9-30.5% for the bilberry and 5.53-38.16% for the cowberry. The relatively distant position of the *Vaccinium* localities is not an obstacle for the local collectors, because of the accessibility of *Vaccinium* populations. There are well functioning purchase centers and traditionally good organization in wild fruit collection in the region.

Belitsa and Yakoruda PS

The *Vaccinium* localities in the area have sufficient area (292.3 ha) and good characteristics to be evaluated as economically important. The mean projective cover of the *Vaccinium* shrubs is high (15-55%), the populations status is generally good and after good meteorological conditions, during flowering and fruit bearing, the economic value of the resource of these areas can be very high. We must underline that the *Vaccinium* localities are accessible and there is a good organization in the utilization of the potential fruit resources in terms of collector groups, buyers` points, transport, etc.

1.5. Analysis on the Content of Heavy Metals

Six samples of dry *Vaccinium* fruits, three per Park from different localities, were analyzed for heavy metals content in the National Center of Hygiene, Medical Ecology and Nutrition". Five elements were evaluated - cadmium, zinc, copper, arsenic and lead, using standards for wet and dry fruits applicable to Bulgaria and the European Community. These elements were analyzed according to the norms of the Bulgarian standards (Regulation No. 5 of the Ministry of Health/ 1984). The samples were far below the maximum acceptable norms for dry fruits. The heavy metals analysis for fresh fruits was guided according to EU standards. The results showed that the samples were well within the requirements of the Regulation of European Committee, 466/2001, for fresh fruits.

2. General Information About *Vaccinium spp.*

2.1. Ecological Characteristics and Management Practices

Vaccinium myrtillus is a small shrub from the family *Ericaceae*. In Bulgaria it grows in light coniferous forests, thickets, stony grassy places, peat bogs and alpine meadows in the mountains from 1200–2900 m alt.; rarely it occurs at as low as 900 m above seal level. The bilberry is a typical dominant or co-dominant in the ground layer of light coniferous forests of *Pinus sylvestris*, *P. peuce* and more rarely in sparse spruce (*Picea abies*) associations. The bilberry grows also as a ground layer in beech (*Fagus sylvatica*) forests. *Vaccinium myrtillus* is very often a dominant or co-dominant in the alpine belt as a ground layer in associations of *Pinus mugo* (mainly in Rila and Pirin Mts.) and *Juniperus sibirica*. The bilberry also creates secondary associations mainly in the subalpine belt. These *Vaccinium* communities originate in places of associations with *Pinus peuce*, *P. sylvestris*, *P. mugo*, *Picea abies*, *Fagus sylvatica* and *Juniperus sibirica* destroyed by man. With their thick ground cover, the associations of bilberry are an important soil-formatting, soil-protecting and water-regulating factor.

The major, commercial resources of bilberry in Bulgaria are located in West and Central Stara planina, Ossogovo, Vitosha, Rila, West and Central Rhodopi Mts., and in more restricted conditions, in Pirin, Slavjanka and Belasitsa Mts. (Fig. 1)

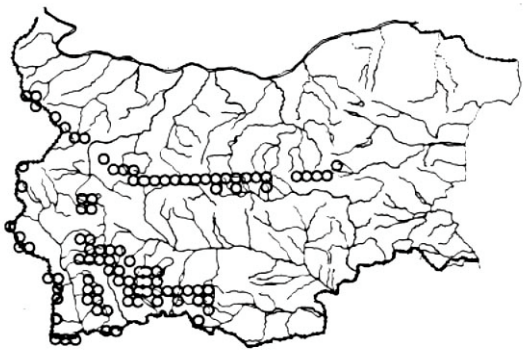

Fig. 1 Distribution of *Vaccinium myrtillus* in Bulgaria (in "Horological atlas of the medicinal plants in Bulgaria", 1995)

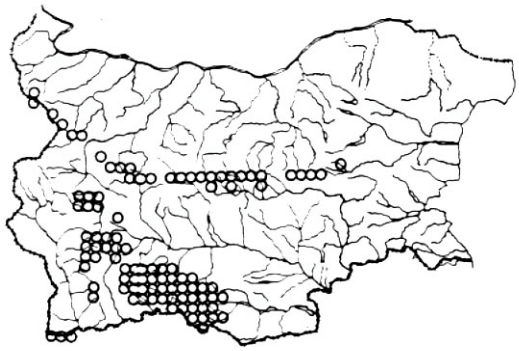

Fig. 2 Distribution of *Vaccinium vitis-idaea* in Bulgaria (in "Horological atlas of the medicinal plants in Bulgaria", 1995)

The bilberry flowers in June – July, fruits in August-September. The short life cycle directly depend on the habitat and meteorological conditions during the vegetation season. The bilberry is a xenogamic plant, which is pollinated by wild bees and other insects visiting it for pollen and nectar. Ectotrophic mycorhysis is typical for the plants. The seeds are dispersed by the wildlife.

Vaccinium vitis idaea is with similar distribution in the country as well as eco-biological and phytocoenotical characteristics. (Fig. 2)

Considerable amount of scientific information exists about the distribution and economic use of *Vaccinium spp*. in the arctic, boreal and high-mountain areas in Eurasia. Studies on the population ecology and biomorphology, phytocoenology, biological and economic productivity, etc. have been conducted in different parts of the distribution areas of bilberry and cowberry. The results are published in dozens of scientific papers.

For the purposes of the current study it is important to pay attention to the facts regarding the fruit yield. It has been proven that the fruit yield varies considerably in different years though in one and the same locality. Moreover, the data about the high yield year periodicity are relatively contradictory. This high variation of the fruit productivity of *Vac. myrtillus* is due to the great differences in the ecotops as well as the meteorological extremes (late spring and early autumn frost, rainfall regime, the temperature during vegetation and flowering, the thickness of the snow cover and the extreme low temperature in winter). It has been established that the fruit yield cannot be accurately forecast on the basis of the flowering intensity because the meteorological extremes play a decisive role.

The main management practices applied in countries with traditions in collecting of *Vaccinium* fruits include the rotation of picking areas, and controls on quantities that are picked. These regimes and norms are established on the basis of regular data collection (usually annual) on the levels of exploitable resources. A possible, annual fruit collection in the areas of distribution of *Vaccinium* in Eurasia (Ukraine, Russia), is calculated as 50-70% of the exploitable resource. Annual harvest plans are related with a monitoring of the seasonal development of the plants, with emphasis on the flowering and fruit bearing.

2.2. Dependence of the Wild Animals on *Vaccinium* Plants

Together with the ecological role of the *Vaccinium* plants in the high-mountain habitats, they have their place in the food specter of many animal species as well.

More than 25 bird species such as: capercaille *(Tetrao urogallus*), hazel-hen (*Bonasa bonasia*), rock partridge *(Alectoris graeca*), wild pigeons (*Columba spp*.), ring ouzel (*Turdus torquatus*), etc. regularly feed on *Vaccinium* plants. These birds eat the young leaves and shoots in spring, fruits in summer, and leaves, buds, shoots and fruits in autumn. The studies on the entomofauna of the *Vaccinium* associations show that about 190 insect species are related to them.

Literature review as well as experts knowledge provide information and evidence that the following animal species occurring in Rila and Central Balkan National Parks use *Vaccinium spp.* as food resource:

Insectivora
1. *Sorex araneus* – Common shrew

Rodentia
2. *Clethrionomys glareolus* – Common redbacked vole
3. *Muscardinus avellanarius* – Common dormouse

Carnivora
4. *Vulpes vulpes* – Common red fox
5. *Ursus arctos* – Bear
6. *Martes martes* – Pine-marten
7. *Martes foina* – Beech marten
8. *Meles meles* – Badger

Artiodactyla
9. *Sus scrofa* – Wild boar
10. *Cervus elaphus* – Red deer
11. *Capreolus capreolus* – Roe deer
12. *Rupicapra rupicapra* – Chamois

The most important of all these species are *Ursus arctos*, *Martes martes*, *Capreolus capreolus*, and *Rupicapra rupicapra* due to their conservation status and/or their higher dependence on *Vaccinium* fruits as food.

The use of *Vaccinium* plants as food is in great extent seasonally dependent and is influenced by the altitude zones and type of the biotopes inhabited by the mentioned mammals. That is why the food composition for each animal species is specific for the different regions of the National Parks and vary considerably.

The common dormouse (*Muscardinus avellanarius)* feed on berries is a well-known fact. This species have been observed in the dwarf-pine zone in Rila National Park, where the animal uses *Vaccinium* as food.

Common red fox (*Vulpes vulpes)*. This species feeds mainly on small rodents, but in late autumn and in winter the vegetation food incl. fruits (berries as well) can be over 50% of the number of remnants in the stomach content. Atanassov (1958) reports about excrements totally consisting of *Vaccinium* parts.

Bear (*Ursus arctos)*. In the studied territories of the Central Balkan National Park meat is a considerable part of the food of this carnivore, but in summer it prefers berry species. In this season the berries can be up to 83% of the food consumed, incl. *Vaccinium spp*. to a certain extent. Thus it can be stated that *Vaccinium* plants are not a major food, but takes a relatively important part in the food of the bears in a certain period of the year – mainly in August.

Beech marten and pine-marten (*Martes martes & Martes foina)*. About 50 – 100 g food has been found in the stomach of beech marten. Data from North Europe show that fruits (incl. berries) make about 12% of its food, and in some seasons can exceed 43 %.

The ration of the pine marten is about 240 – 250g food per day. Vegetation food (incl. fruits) takes even bigger part than in the food of the beech marten – in autumn and winter sometimes up to 100% of the food.

Red deer (*C. elaphus*) uses *Vaccinium* plants for food and according to some studies shows average preference to them.

Studies on the food of the roe deer *(Capreolus capreolus*) in the coniferous forests in Bulgaria (Rhodopi, Pirin, Rila Mts.) show that the shoots and young branches of the bilberry and the fruits of the cowberry are among the major food in the biotopes where *Vaccinium* plants participate in the forest undergrowth.

As a whole, it can be concluded that *Vaccinium spp*. are not among the basic foods (as quantity) used throughout the year by Bulgaria's high-mountain animal species. However, in certain short periods of the year, *Vaccinium spp* become a more important part of the diets of some e animals, including rare and threatened species. This dietary dependency should be taken into consideration in the management of the blueberries accordingly. Currently, there appears to be only limited cause for concern, as many animals can still feed at night. However, it may be important to consider the disturbance of animals, caused by collectors during the period of bilberries and other wild fruits harvesting.

3. Conclusions and Recommendations

3.1. *Vaccinium spp*. Resources Management and Monitoring

Vaccinium spp. can be considered an important economic resource for national and local livelihoods. This importance is directly linked to the status of their populations in protected areas and high mountains. Population status is highly dependent on ecological and meteorological conditions in *Vaccinium spp*. habitats, as they impact fruit yield. To date, the status of populations appears to be less dependent on the activities of resource collectors, but this can only be determined, using this resource assessment and its results, over time.

The sustainable harvesting of *Vaccinium* resources requires a monitoring system to be organized and implement in the National Park territories, at a minimum. The monitoring of the state of the populations should include information about the seasonal development and health of the *Vaccinium* populations to be collected. It is best to conduct annual phenological observations, using permanent control areas, representative of the commercially important *Vaccinium* localities in all Park Sections.

In addition, sustainable harvesting should include improvements to the preparation and planning for each seasonal collection, resource status assessment and yield prognosis, permit system, improved collection techniques as well as improved coordination with buyers. For successful sustainable use of the non-timber natural resources greater public awareness and information regarding sustainable harvesting, collection calendars and the role of the National Parks and collectors is required.

In analyzing the results of the current resource assessment, the following recommendations can be given:

The responsible authorities: National Nature Protection Service / National Parks Directorates to take the necessary actions in order:

1. To make an assessment of the exploitable *Vaccinium* resources during the vegetation seasons of 2002 and 2003;
2. To introduce regulations for periodical assessments every three to five years;
3. To conduct annual phenological observations in the localities (during flowering and fruit bearing phases) to assess the state and prognosticate the exploitation resources;
4. To educate the Park rangers about the ecology, biology, phenology of *Vaccinium spp*.;
5. To strengthen the guard during the collection campaigns as well as to mark appropriately the high mountain reserve zones forbidden for human activities;
6. When and where it is necessary to control the number of collectors in particular regions;
7. To limit the grazing of domestic animals in the economically important *Vaccinium* localities;
8. To develop and maintain a database for the bilberries (*Vaccinium myrtillus*) and cowberries (*Vac. vitis-idaea*) localities as part of the national Medicinal plants

cadastre. The location and areas of the localities should be incorporated into the digital models of the Parks and the observations collected about each of them to be updated in regular bases in the attribute data;

9. To develop the necessary forms for information collection and storage in electronic and hard copy format to be kept into the medicinal plants` cadastre;

Together with collectors and buyers and their representatives:

10. To determine and strictly to be observed periods and regions for fruit collection;
11. To determine and observe norms for fruit collection, which to be appropriate for every locality and to apply the rotation principle in the exploitation of the resources. The determination of the quotas to be on the basis of the results from the observations in point 3.

3.2. Role and Responsibility of the Interested Parties (MoEW/NPD, fruit collectors, BAS, etc.) in the Management of NTNRs in the National Parks

Ministry of Environment and Waters guides and coordinates the development and realization of the state policy for protection and sustainable use of the medicinal plants and non-timber natural resources.

National Parks Directorates play major management role in the preparation of the management plans for the non-timber natural resources, development of annual plans for the use of priority species, monitoring, issue of collection permits, preparation of regulations for the collection campaigns, etc.

It is reasonable that the flora experts from the National Park Directorates participate in the monitoring process as supervisors. They should conduct the field activities together with the Park Section Heads and teams of Park rangers. The collection of information on the field must be elaborated by the Park rangers after training on methods for phenological and population observations. Specialized training courses are necessary to explain the goals and necessity of resource monitoring, ways of information gathering, as well as the documentation of results.

The flora experts should work together with the Park GIS experts to develop and maintain the database on medicinal plants localities.

For better understanding and agreement in enforcing the measures under points 10 and 11 above, representatives of the collectors (mainly people whose primary occupation is medicinal plants collection, this includes buyers, non-formal leaders from the collection groups, and local government) have to be involved in resource assessment activities and the monitoring of the annual development of the bilberries and cowberries fruit, and the monitoring of annual harvests.

The scientific institutions (Bulgarian Academy of Science – Institute of Botany; Institute of Rose and Ethereal Cultivated Plants, Kazanluk town; and, Universities – Sofia University, Forestry University.) should be involved in supplying scientific and methodological help necessary for the resource evaluation and monitoring of the non-timber natural resources. The scientific participation is necessary for the preparation of the management plans for these resources. The preparation of these plans is just beginning in Bulgaria and to date, there is still no approved or acceptable model for such a resource management plan. The methodology for the field assessment of the resources are still not validated and approved for national application.

Scientific-methodological help is important to the establishment of the monitoring system of the medicinal plant populations, their associations with ecosystems and their productivity. Involvement of the scientists is needed as well for the education of the National Park experts and rangers, as well as for their training in monitoring of the medicinal plants resources.

Non-Timber Natural Resources and National Parks

PART 3

Economic Growth and Management Options

Summary

Considerable local and national economic activities rely upon non-timber renewable natural resources (NTNRs) coming from the National Parks system of Bulgaria. The harvest of NTNRs from National Parks, however, including berries (particularly blueberries – (*Vaccinium spp.*), wild mushrooms (*Macromycetes*), and a range of wild herbs and medicinal plants has been known to cause site damage, impacts to local habitats, and can threaten important animal and plant populations.

The last 10 years has witnessed a significant increase in the unregulated collection of many NTNRs from many of the country's wild habitats. Central Balkan and Rila National Parks are presently working to quantify and qualify the productivity of their high mountain ecosystems, and mitigate the impacts caused by personal and commercial harvesting. Irrespective of the diagnosis of these studies, an improved regulatory system is required.

In addition, the Government of Bulgaria is interested in using NTNRs as a base for economic development and growth in the communities that surround the national parks.

This report focuses on the opportunities for economic development and regulatory control of non-timber natural resources in Bulgaria's National Parks – particularly the two NTNR collaborative management pilot areas in Rila and Central Balkan National Parks.

There are two major conclusions from this work:

- Ensuring the ecological integrity and sustainable yields of the resource base. NTNR management in the National Parks must be improved.

- Creating favorable conditions for local investment in communities adjacent to the National Parks, and that serves as the homes for most NTNR collectors.

We propose two strategies for affecting such change:

- The first strategy is to improve the current system of permitting.

- The second is to complement permits with a "commission" system that places resource management responsibility in the hands of the private sector, with public sector oversight.

The results of this economic assessment indicate that it is necessary and reasonable to proceed with the design of improvements for permitting and enforcement procedures. These should be implemented before the onset of another collection season. Once in place, this revised and refined system will serve to protect the resource and allow benefits to continue to flow to local communities. Specific recommendations regarding the permit system are addressed in the report.

At the same time, we recommend developing a "commercial harvest contract" or "commission" system that will complement the permit system and may encourage local investment. A model for a commercial contract is offered within this part of the report.

These systems should ensure that the benefits of resource flows from the parks continue to flow to local communities by protecting their natural ecology; **AND** may set the stage for private investors to capitalize on more orderly harvesting and resource management required by organic certification. Neither strategy will function, however, without a commitment by the relevant institutions to enforce the laws that govern resource management in and around the national parks.

Other direct interventions by the BCEG project, such as the development of cooperatives or SMEs, are not considered appropriate since there already exists substantial competition and commercial capacity throughout the supply chain. Chances are limited that new cooperatives or SMEs with public sector financing or technical assistance will meaningfully benefit local NTNR collectors.

The merits of organic certification as an inducement offered by Parks to commercial investors is analyzed. The results suggest that organic certification should be left to the private sector, and that opportunities for successful organic certification will arise with market demand. Organic certification is not something in which the National Park Directorates should become engaged.

The report illustrates that significant benefits are already generated by protected areas policy and National Park management plan provisions. Local economic benefits from the sale of non-timber natural resources legally harvested from the country's national parks, already far exceeds the national government subsidy for national park operations.

Annual, seasonal sales of non-timber natural resources gathered from within the Park and its surrounds provides a substantial part of rural household incomes for communities and in particular, ethnic minorities around the Parks. This trend is continuing, if not increasing, in the face of high regional unemployment, and national economic reorganization. This assessment demonstrates that the annual cash and in-kind income generated through the collection of blueberries (*Vaccinium spp*.) **alone**, is greater than the annual government subsidy to the three national parks.

Introduction

i. Background

Bulgarian protected areas are suspected of providing substantial commercial amounts of non-timber natural resources destined, largely, for export markets. Two of these protected areas - national parks - Rila National Park (81,046 hectares) and Central Balkan National Park (71,669.5 hectares) are characterized by significant, seasonal extraction of non-timber natural resources for personal and commercial uses. Both parks harbor significant biodiversity within a landscape of high mountain meadows, alpine and sub-alpine environments, and mixed deciduous/coniferous forests. There are distinct areas of both Parks that contain substantial populations of edible or fruit-bearing plants (e.g. blueberries, herbs) medicinal plant parts, and mushrooms.

Both National Parks are managed under the regimes and norms of protected area categorization (IUCN Category II) that favors conservation, recreation, scientific study, and education. Limited renewable resource extraction is provided for in both Parks under the first National Park management plans for these territories (2001-2010). These plans were recently approved by the Council of Ministers of the Bulgarian Government (June 28, 2001), and are now considered legal instruments of the Protected Areas Act (November 1998). Provision for non-timber natural resource harvesting (within the country) is also addressed by the Bulgarian Medicinal Plants Act (March 2000). Both pieces of legislation are the result of priority conservation policy identified in the country's first National Biological Diversity Conservation Strategy (produced in 1994, and adopted by Parliament in 1998).

Rila and Central Balkan National Parks are managed as state property, with dual purposes: (a) the conservation of environments, systems, species and habitats; (b) development of conservation opportunities that provide benefits to local communities (communities that are physically located in close proximity to park boundaries).

The USAID-funded, Biodiversity Conservation and Economic Growth Project, and its counterparts in the Ministry of Environment and Waters, are examining ways in which real economic benefits can be derived from activities that favor the conservation of park resources and allow sustainable access and use. Towards this end, the Project and Park Directorates have identified two pilot areas – territories in which the model of collaborative management that supports sustainable, non-timber natural resource harvesting, can be tested and developed.

The two pilot areas are the subject of a situation analysis, conducted by the BCEG Project and National Parks staff in the May-June 2001 period. A description of the pilot areas (in detail) and the results of the situation analysis form the **Part 1** of this report.

Both pilot area territories are approximately the same size (12-14,000 hectares) and have several communities/villages and small towns, falling within each pilot area's coverage. Both

pilot areas harbor significant non-timber natural resources identified in the early stages of management planning, but not yet quantified.

Activities related to sustainable non-timber natural resources management are based on a strategy and approach of collaborative management. Thus, national park staff, (with technical assistance and logistic support from the BCEG Project) have initiated discussions with collectors, buyers, processors, and local government associated with resources collected from these pilot areas. These discussions have allowed the Park and BCEG Project to develop strong local relationships focused on matters related to NTNR access, collection, control, management, etc. Collections of local interested parties are beginning to coalesce into groups, which may serve as the vehicle for future, targeted National Park information, education, and enterprise activities.

ii. Context

The collection of NTNRs is traditional among many Bulgarians, and especially the communities neighboring the parks (***People and National Parks, Attitudes, Practices and Prospects in Bulgaria*** **– GEF Biodiversity Project, April 2000**). The level of collection, however, is believed to have both increased significantly and become more poorly regulated with the Bulgarian transition from a centralized economy. This is due in part to elevated unemployment, as well as to significant changes of responsibility and control among national, natural resources management bodies. The increase can also be attributed to increased number of players in the NTNR supply chain, and increased access to international markets for these products.

The ecological impacts of collection may inhibit regeneration of the harvested species as well as cause damage to other species within protected mountain ecosystems. The National Park Directorates, with assistance of the BCEG Project have completed a resource assessment (**Part 2 of this report**) that describes the context and impacts *of Vaccinium spp*. collection activities in both Park pilot areas. No significant damages to the populations of collected species, or their surroundings, however, were found.

iii. Supply Chain

Plants, berries, and mushrooms collected from National Parks enter a supply chain not uncommon to most parts of the world. Independent individuals and families (collectors) enter Parks throughout the summer months to collect. This collection is conducted largely under legal provisions for “personal use” (Medicinal Plants Act, Article 21), however the ultimate destination for the collected resources is often commercial markets. The situation analysis and observations made during field visits in June-October 2001, indicate that hundreds of collectors enter the National Parks every day during harvest season, in a regular and organized fashion.

Collectors of larger quantities, often sell their harvest to buyers at designated areas outside of Parks, as often as each day. Buyers of NTNRs often assist collectors with transportation to collection areas and to buying sites for a fee. In the case of blueberries and raspberries, the buyers consolidate each day's harvest in flats and/or plastic containers, and transport them to processing facilities by refrigerated truck. Multiple buyers operate in each region; and not all buyers are registered.

Processing facilities receive trucks on a daily basis and generally wash and freeze the product. Some facilities are equipped to further process the product into canned goods and jams. Processing facilities do not specialize in one product, since harvest seasons are relatively short and volumes relatively small or unpredictable. From here, the product is transported to either local consumers or exported. In the case of blueberries, most production is exported. Exporters operating in Sofia specialize in the sale of the products, and may own or have long-term relationships with processors.

This supply chain, which carries the product from the park to the consumer, is composed of many competitors. During this phase of the assessments, we observed that:

- There is an abundance of independent collectors;
- Multiple buyers can be found at all locations;
- A substantial industrial base is available for processing; and,
- A number of exporters operate in the market.

Table 1 provides a summary of price figures collected during interviews with individuals and firms throughout the supply chain. We did not collect a complete accounting of costs, but processors most likely incur the greatest costs in the form of transportation (1.2 leva/km for a 20 ton truck, 2.5 leva/km for a 20 ton refrigerated truck) and (factory) freezing (0.38 – 0.42 leva/kg).

TABLE 1
WILD BLUEBERRY SUPPLY CHAIN
Revenue analysis

	Sale Price (leva*)	***Revenue Margin (leva)***
Collector	1.8 – 2.5	1.8 – 2.5
Buyer	1.9 – 2.7	0.1 - 0.2
Processor	2.5 – unknown	0.5 - unknown
Exporter	2.8 – 5.0	0.3 - unknown

* Bulgarian *lev* (plural *leva*) is pegged to the German mark, which at the time of writing was equivalent to 0.45 dollars.

As we continue to quantify commercial volumes of NTNRs in Bulgaria and the amounts sourced from National Parks, we estimate, at present, that Bulgaria's total production of blueberries *(Vaccinium spp*.) averages 700 tons per year. In addition, three to seven thousand (3000-7000) tons of mushrooms, 12 thousand (12,000) tons of herbs (pers com, Bioprograma) are collected, and approximately 300,000 individuals collect NTNRs in the country (pers com,

Dionisiev). We also estimate that up to eighty percent of Bulgaria's commercial blueberry harvest may come from national parks, 30 percent of mushrooms and raspberries, and a small percentage of all other herbs (pers. com., Gussev).

Each National Park has embarked on a program of NTNR resource assessment for species of commercial value found within their boundaries. This is part of each Park's three-year action plan, and a requirement under the Medicinal Plants Act. The *Vaccinium spp.* resource assessment summarized in **Part 2** of this study includes the first organized effort of National Parks to conduct a commercial NTNR assessment.

1. Economic Development Interventions

This economic analysis of the supply chain focuses on the potential interventions for improving the local economic development stimulus regarding NTNR harvesting from National Parks, and the means to ensure the ecological sustainability of these activities.

Sustainable NTNR Collection and Economic Benefits to Local Economies

Within the guidelines and objectives of the Protected Areas Act, and Management Plans, both National Parks already provide a significant benefit to local communities. Both territories are already a source of legally, exploitable commercial products. In this way, the management policy of the national parks is providing a direct subsidy to local communities, as well as protecting Bulgaria's natural heritage.

Direct and measurable economic benefits accrue to local communities when Parks ensure the long-term sustainability of, and accessibility to, commercial NTNRs. This management approach supports the principles of collaborative management, AND provides direct, measurable economic benefits to local resource collectors, and subsequently, to the local economies of both Parks.

Our economic benefits analysis for blueberries *(Vaccinium spp.)* alone, suggests that the cash revenue and in-kind value generated from the annual blueberry harvesting alone is in excess of the annual operational subsidy paid to the National Parks, in 2001**.**

We considered the "gate price value" for blueberries originating within the three National Parks (*estimated annual average yield for the three parks is 500 tons @ an average price of 2.5 BGL/kg, or 1.25 million BGL/year),* and compared this with the annual operating subsidies received by the same Parks (*approximately one million leva for the three Parks*). While we realize that annual blueberry harvests vary each year, the average appears well within the established harvest norms for the last 5-8 years.

A high percentage of the average annual yield of NTNRs is already entering local economies as cash. It can be demonstrated that NTNR collection represents a significant portion of local collectors annual income, and in the face of significant unemployment and subsistence agriculture, is one of the most important forms of income generation.

When we consider the cash value added to this product throughout the supply chain, we can conclude that the present policy on sustainable harvest of NTNRs from National Parks is subsidizing a surprisingly large proportion of the Bulgarian economic growth – and is far in excess of the investment (subsidy) costs.

Our assessment continued with an evaluation of five interventions. We recommend that a new model for NTNR management in the National Parks should draw primarily from two of these.

1.1. Stabilize Access to and Productivity of NTNRs

Stabilizing access to and productivity of NTNRs requires a management system that considers the natural ecology of wild resources, and the equitable distribution of the economic benefits accrued from their collection.

A potential model management system is that used for hunting and fishing licenses in the United States.

Box 1: Hunting and Fishing Permits

Hunting and fishing licenses are generally distributed to residents local to the areas where hunting and fishing activities occur. In many cases, these areas are rural and hunting and fishing contribute to local economic welfare. The issuance of licenses therefore must control for over-harvest and subsequent damage to natural populations of fish and game, and at the same time provide sufficient access to meet local needs. Each year a regional commission assesses the health of the natural population of fish or game and determines a sustainable harvest level for that population. Permits are then issued commensurate with that level of harvest. In the case of fishing, the commission issues permits (via local merchants) to individuals for a daily catch limit for a finite period of days. In the case of hunting, the commission issues tags for each animal an individual is permitted to take. The permit system requires that individuals present a permit or tag to commission officials if they are in possession of fish or game, or are in the process fishing or hunting. Officials primarily spot check hunting and fishing areas, and issue fines to individuals without permits[1].

We therefore, considered the implementation of a ***new permit system***. A specific amount of harvest from a natural population must be regulated, but ample access by local collectors is desirable. A revised and simple permit system, where all collection is permitted, and designated by area and volume, could help to ensure the ecological productivity of NTNRs in Bulgaria's National Parks. **The system also would maintain the local economic benefits generated by the parks for local communities**.

We recommend a permit system that is straightforward to implement and not likely to increase park management costs. Ample staffing exists, and infrastructure is in place or can be readily installed.

1.1.1. Collection Permits

Based on an analysis of threats to commercial populations of NTNRs, AND their ecology, Bulgaria's National Parks require a regulatory system that will permit the control of harvests of NTNRs and the collateral impacts caused by their collection.

[1] Fines are designed such that: *benefit of non-compliance < probability of being caught x fine.*

Experience with NTNR harvest regulation worldwide indicates that problems of over-harvesting and enforcement are universal challenges. In addition, economically and socially marginalized communities often rely greatly on NTNRs as a primary source of income, and therefore regulatory approaches to control their harvests must consider the protection, and possibly enhancement, of this economic opportunity.

Based on a review of regulatory systems in both developing and industrialized economies, it appears that the following are transferable elements of permit systems that could apply to Bulgaria.

1.1.2. Key Elements of a Permit System

An effective permit system should have several key attributes. The permit system must improve the ability of resource managers to ensure the ecological health of the NTNRs and the ecosystems in which they reside. The primary social objective of the permit system is to ensure reliable access to the resource by the local communities that use them. These communities should find it easy and not costly to acquire and use permits, and park managers should find it easy to issue permits and enforce their use. Lastly, the public cost of administering the permit system should be appropriate to the benefits it generates, and in the best case scenario, be self-financing.

Improving Ecological Management

Scientific monitoring of resource abundance, impacts from harvest, and regeneration, guide ecological management of NTNRs. Each NTNR has specific requirements for harvest technique, intensity, and timing. Traditional knowledge and harvest practices may be sufficient to guide collectors to avoid damaging the resource, but in many cases regulatory safeguards are prudent. A permit system for NTNRs in Bulgaria should serve as an effective safeguard from over-harvesting and collateral damages to natural ecosystems in the National Parks. Five components should be included in the permit system to accomplish this objective.

1) *Establish ecologically sustainable harvest parameters:* Park managers must complete assessments of the resources, allowable harvest intensities, appropriate harvest timing, and techniques (e.g. harvesting entire plants in order to commercialize only its fruits, must be prohibited). The remaining components of the permit system will draw from these parameters.
2) *Control Area of Harvest:* Parks should be zoned into harvest areas that serve as independent management units. Harvests should be limited to specific areas until monitoring indicates that the desired harvest intensity and impact has been reached. At that time, a new harvest area should be designated. Permits should be issued for a period of between 1 week to 1 month, valid for a specific area of harvest. When a new harvest area is opened, a new set of permits is issued for that area. Permits should either include a map of where the harvest area is located, or be readily interpreted using posted maps throughout park access points. Information on permits should use basic/universal symbols wherever possible to accommodate low literacy levels among collectors.

3) *Control Number of Harvesters:* Each individual should require a collection permit. The number of permits issued for a harvest area should be limited to the estimated level of human impact allowable for the ecosystem. This estimate should be derived based on the average volume of daily collection of individuals harvesting NTNRs in the park and the level of collateral damage caused by collection activities. Each time a new harvest area opens, new permits should be issued, in the appropriate quantities.
4) *Control Timing:* Seasonality of products, their regeneration characteristics, and other timing issues should be considered in the issuance of permits. Timing may be a balance between minimizing damage and maximizing yield for collectors.
5) *Control Harvest Techniques:* Collectors use a range of methods and selection criteria in their work, some of which can be damaging to the resource and the local ecology. For example, uprooting plants in order to harvest some of their leaves or fruit, or harvesting large spore-rich mushrooms, reduces the long-term productivity of the area and may have other adverse ecological impacts. Damaging harvest techniques should be prohibited and identified as such either on permits, or on posted materials throughout park access points.

Local Community Access

NTNRs are an important source of subsistence and commercial activity for communities local to Bulgaria's National Parks. An important management objective of the Park system is to maintain community access to these resources. Three actions are required to accomplish this objective.

1) Ecological management parameters and regulation must be properly designed and executed (see above) to ensure that the renewable NTNRs continue to prosper within National Parks.
2) Communities should be ensured a minimum harvest area each year. Actions that might constrain total harvestable areas include placing management zones off limits for a period to allow recuperation of ecological damage, and the issuance of NTNR commercial harvest contracts to private companies
3) Keep permit fees as low as possible, if not zero. The objective of permit fees is not to generate revenue for park management. **Park management is in fact a public subsidy to local communities, and in this way serves as an investment in regional economic stability and development. The costs of a permit system may be cross-subsidized by revenues from a NTNR commercial harvest contract (or commission) in the Parks.**

Ease of Acquisition and Use

Permits should be easy to acquire and use. The introduction of time consuming or complicated processes is a cost to local collectors that should be avoided. Ease of acquisition and use can be accomplished by following three guidelines.

1) Permits should be issued at multiple points around the parks. Options include entry points into parks, buying stations outside of parks, and through private businesses within towns. Permits should NOT require paperwork of any kind (e.g. applications).
2) Permits should include a map indicating where harvest is permissible, for how long, and a description of harvest techniques that are allowed only.
3) Permits should be issued periodically. If a finite number of permits will be issued for each harvest area, and the harvest area will be active for a finite period of time, periodic blocks of permits should be made available until the limit of individual permits and harvest time have been reached. This prevents hoarding of permits by ambitious individuals.

Enforceability

The permit system should be easy to enforce and at low cost to park managers. The system can be readily and cost-effectively enforced through spot checks in the Park. Spot checks should be conducted at random, and ascertain whether individual collectors: a) have a valid permit; b) are in the specified area of harvest for which they have a permit; and, c) that the collector is not using prohibited harvest methods. Random spot checks, accompanied with fines for permit violations[2] should serve as sufficient incentive to follow Park management regulations.

Public Cost

The cost of administering a permit system includes: periodic ecological monitoring of harvest areas, permit design and printing, permit distribution, spot checks of harvesters and enforcement actions, and an educational campaign to introduce the permit system and educate NTNR collectors of the reasons for permits and the proper procedures for acquiring and using them. The costs of administering the system could be covered by: a) permit fees; b) NTNR commercial harvest contract revenues; b) other Park management funds.

1.1.3. Roles and Responsibilities

In order to properly execute a permit system, new roles and responsibilities must be introduced. Park managers will be required to fulfill several new functions, and NTNR collectors will be responsible for acquiring and using permits properly. It is important to consider that all changes to the status quo may require targeted education of collectors.

Collector Responsibilities

Collectors must acquire permits when they become available, and adhere to their restrictions. Primarily, collectors must operate within active collection areas, as defined on their permits.

[2] Fines should be greater than the perceived benefit of breaking regulations. Mathematically, fines should be estimated as: profit from regulatory violation / probability of enforcement action / probability of successful legal imposition of penalty.

Collectors must present their valid permits upon request of park managers. If properly implemented, the permit system should present no material cost in terms of resources or time to the collector. Since permits could be available from rangers upon entry into the park and at buying stations, there should be no difficulty in acquiring them. Permits most likely will not diminish the yield available to collectors, so adherence to permit restrictions should not cause any economic hardship.

Park Manager Responsibilities

Park managers must make the permitting system as seamless and transparent as possible to collectors. If a permit system is to be effective, park management must assume four responsibilities.

1) Develop a program to introduce the permit system and educate NTNR collectors. The program should include easy to understand materials (e.g. explanatory pamphlet) that are available before harvest season, and when permits are acquired.
2) Permits must be available at many convenient locations, including major access point to national parks, buying stations, and points of commerce in communities surrounding the parks.
3) Permit restriction must be enforced in a consistent and fair manner.
4) Park managers must perform spot checks of collection activities to ensure collectors are adhering to permit conditions.

TABLE 2

NTNR HARVEST PERMIT SPECIFICATIONS

Regulatory Element	Objective	Management Options	Critical Tasks
Area of Harvest	Limit harvest to specific management areas for a finite period of time.	Multiple harvest areas can be created, allowing a harvest rotation system. The number of collectors in an area of harvest is limited, not the volume of collection per collector – oversight *only* requires ensuring collectors remain in the area of harvest.	Designate harvest areas. Restrict collection to active harvest areas.
Intensity and Duration of Harvest	Limit intensity of harvest to sustainable levels for target resource and entire ecosystem.	Each management area will be closed to harvest as soon as the harvest is commercially complete, or collateral damage to the ecosystem exceeds allowable limits. In some cases management areas can remain closed during harvest periods if regeneration/recovery is required.	Monitor ecosystem indicators for management areas before, during, and after harvest. Determine when to close a harvest area and for how long.
Permit Accessibility and Usability	Permits are easily acquired and carried by collectors.	Permits are small, complete with critical information, and easy to read/understand. They are acquired readily and immediately at multiple locations that collectors frequent.	Design simple permits and make them available throughout harvest season at multiple points.

1.2. Organic Certification as a Tool for Increasing or "Adding" Value to Local NTNR Harvests

This analysis focuses primarily on certification for European export markets.

One critical finding is that organic certification takes into consideration the entire production process. As a result, production systems that involve frequent changes in operators, production and transportation equipment, or involve any contact with non-certified products, will automatically be disqualified. As a result, it is our opinion that the conventional collection system in Bulgaria ***cannot*** achieve organic certification. However, a medicinal plants commercial harvest contract to a single entity could overcome these barriers.

1.2.1. Background

Organic certification is a method of obtaining third party verification that food products, in this case wild medicinal plants, are not exposed to, nor include, chemicals, biologically engineered products, or irradiation considered harmful to human health and the environment by consumers. Certification offers access to special organic markets via a labeling protocol that is regulated in many European countries. Estimates of price premiums for organic products range from 20 to 400 percent over similar produce without organic certification[3].

Organic certification could provide two benefits to Bulgarian medicinal plant collectors. First, organic certification could improve export market prices for Bulgarian medicinal plants. Second, certification could serve as a market incentive for collectors to follow resource management guidelines in Bulgaria's National Parks. This is because certification guidelines include sustainable collection practices for wild products, which is the basis of park regulations for medicinal plant collection.

1.2.2. Organic Certification Process

Organic certification in Europe is based upon guidelines established in European Union (EU) Regulation 2092/91. Those guidelines are made operational by certification agents that are members of the International Federation of Organic Agriculture Movements (IFOAM), and work with organic food producers to obtain certification and maintain it over time through periodic inspections. There are many certification agents, mostly private companies, operating in Western Europe. Three major companies are **ECOCERT** (France, Germany, Italy, Spain, Portugal), **Naturland** (Germany, Switzerland, Russia, Turkey, Egypt, India, Latin America), and **Skal** (Netherlands) - (see Appendix 3-A for a list of contacts)

[3] Comprehensive market data on price premiums for medicinal plants collected in Bulgaria is not available. Price is affected greatly by quality considerations, seasonality, and in the case of products with small markets, the ability to negotiate export agreements. The Food and Agriculture Organization is presently conducting comprehensive research on markets for organic products in Europe.

1.2.3. Requirements

Certification requirements vary between certification agents, but the basic principals apply: the site must be free from contamination of any materials listed in Annex II of EU regulation 2092/91; production, transport, and processing must be separate from non-certified products; and, in the case of wild products harvests must not damage the natural ecosystem.

"Naturland" provides the following specific guidance for wild harvests:

1.1 *The possibility of contamination of the products in the collecting areas by pollution from other areas has to be excluded.*

1.2 ***Clear demarcation of the collecting area of the wild grown products to be certified has to be possible. Therefore the areas have to be clearly identified by way of land register maps (cadastre) (drawing of plans if necessary).***

1.3 *The collecting rights have to be identified clearly within the project. One or more persons have to be named that will be responsible for the following range of duties:*

- *survey of all project activities (collecting time, harvested amount, number of gathering persons etc.)*
- *administration*
- *knowledge of the principles of organic agriculture and basic ecological principles.*

1.4 *The production method (collecting and possible cultivating measures)must be able to be proved ecofriendly. Exclusion of damage to the ecological system due to long-term exploitation has to be granted.*

1.5 *Before the start of each collecting season a maximum harvested amount has to be defined annually to prevent overexploitation.*

1.6 ***Regular inspection is obligatory. At least one inspection per year has to be carried out. This independent inspection comprises particularly the inspection of the conditions listed under items 1.3 and 1.4.***

1.7 *Regular residue analysis is obligatory. A list of substances to be inspected as well as their appropriate limiting* value will be given for each product.

"ECOCERT" provides this guidance:

> ***Collected edible plants are considered as organic if it is proven that the collection areas have received no treatments with products prohibited by the regulation for a period of three years before the collection. Furthermore, the collection must not affect the stability of the natural habitat or the maintenance of the species in the collection area. All other requirements must be as for organic production. The registration of the collecting persons/posts is necessary for inspection.***

1.2.4. Procedures

The general procedures for obtaining and maintaining certification are fairly common across certification agencies in Europe. There are six basic steps.

1. *Information Exchange:* The entity seeking certification sends a description of their operation to a certification agent for review. The certification agent sends detailed guidelines for preparation of the operation for inspection.
2. *Inspection:* The certification agent visits the operation and examines the collection sites, transport, storage, and processing facilities.
3. *Certification:* Pending a positive review by the inspector, the applicant becomes eligible for certification.
4. *Contract:* In some cases, the certified producer may enter into a contract that provides the privilege to use a widely-recognized organic label for marketing purposes (examples include Naturland Certified Organic and EKO).
5. *Organic Commerce:* Once certification is acquired, and possibly an organic labeling license, the producer may engage in the sale of organic products. This step may require submission of certification materials to authorities in countries to which products will be exported.
6. *Periodic Inspection:* The certifying agent will return on at least an annual basis, and sometimes without prior appointment, to re-inspect the operation. Renewal of certification is dependent on a positive inspection review. Inspections also allow an opportunity for producers to address minor deficiencies before they become serious problems.

1.2.5. Cost

The cost of certification varies across certification agents. In most cases, on-site certification procedures cost less than US$ 500 per day and require several days for inspectors to examine the collection sites, transport, storage, and processing facilities. In addition, travel costs must be included. In other cases, such as Naturland, cost is structured around membership in the Naturland business – a broad network of organic producers who all use the Naturland Certified Organic label. In this case, certification cost is a function of the number of producers (Membership Fee) and a License Fee of one percent of sales to European markets. Given the unique characteristics of medicinal plant collection in Bulgaria, and uncertainty about how a single operator might utilize a commercial harvest contract in a National Park, it is difficult to estimate total costs without submitting a detailed application to certification agents. However, a conventional certification process administered by a company such as ECOCERT could cost approximately $5,000 per operation.

1.2.6. Next Steps

National Parks cannot be certified as simply a *source* of organic wild products. Rather, the entire production process including the Parks as a source, collection techniques, transport, and processing must be certified as a whole. For this reason, it is unlikely that the current production system in Bulgaria can be certified. If a single operator were to obtain a

commercial harvest contract for medicinal plants in National Parks for a period of one or more years, it would be more likely that organic certification could be acquired and maintained. It is also possible that organic certification will serve as an incentive for commission bidders to establish long-term investments in medicinal plant collection and processing in Bulgaria's National Parks.

The next steps are to determine whether a commercial harvest contract system is appropriate for Bulgaria's National Parks, and if so, include organic certification as a component of the contract process. Not until the contract has been issued and the production process put into place, can organic certification be acquired.

1.3. Cooperatives/Associations of Local Collectors/Buyers

Cooperatives and associations are typically formed by a number of independent individuals who identify a benefit to be derived from collective action or organization. Internationally, cooperatives and associations have a wide variety of legal forms, but the basic functions include: vertical integration within the supply chain; bargaining power in price negotiations; and, an organizational and legal mechanism to pool capital to be used for investments that benefit the group (for example, a group of collectors could pool investment to purchase vehicles to transport collectors and their harvests rather than paying others for this service).

Cooperatives require internal governance, accounting of collective financial resources, and norms of membership. Many rural people that have a history of community decision-making easily meet these requirements, but the process of forming a lasting entity requires a very strong commitment on behalf of the members.

We examined the potential for cooperatives and associations of collectors of NTNRs from the National Parks. While we see some opportunities, the benefits may be limited, and the commitment necessary to successfully mount a cooperative must come from within communities and may not be readily substituted with external public-sector intervention. We noted several constraints.

First, mounting an effort to eliminate middlemen (e.g. buyers, transporters) can allow collectors to capture profits that normally accrue to others, but in order for this to work in reality, the cooperative must be able to perform the functions of middlemen at a competitive level. In our experience, efforts by rural collectors of NTNRs to eliminate middlemen have been mounted with optimistic expectations but ended with disappointing results. This is largely attributable to the lack of appreciation for the fact that middlemen perform business functions that are not easily replicated by collectors with little or no experience in those roles.

Second, the gains from additional bargaining power may be limited. There is competition among buyers such that prices are probably not largely outside of normal efficient parameters . Furthermore, the ultimate consumers of berries, herbs, medicinal plants, and mushrooms have a wide range of sources from which to choose. Berry markets select from a range of low cost

Eastern European sources. Those that purchase mushrooms enjoy very low prices from Chinese sources. The market will strictly limit the amount any price can be increased for collectors.

Third, we note that collectors maintain virtually no collective investments, such as vehicles or warehouses. There are several explanations why collective investments are not warranted. The most important of these reasons is the short season of collection (in the case of berries, approximately one month). Most members of the supply chain that maintain capital investments afford to do so by working with a wide variety of products, most of which have far larger volumes than those sourced from Bulgaria's National Parks (e.g. agricultural products).

1.4. Engage in Small and Medium Enterprise Development

Within the NTNR economy in Bulgaria there exists a variety of firms to process and export products collected in National Parks. As a result, opportunities for collectors to process berries, herbs, medicinal plants, and mushrooms may be limited. Instead, products are transported to large-scale processing facilities in other parts of Bulgaria. A common reaction to this type of situation is to search for means to perform more value-added activities closer to the resource base and thereby benefit communities whose livelihood is presently limited to the collection of the resource.

A current trend in development projects is technical and financial assistance to small and medium enterprises (SMEs). As an economic strategy, SMEs are considered agile vehicles for local entrepreneurs to diversify the economy while providing local employment. In the context of conservation, enterprise development has been used widely as a tool to stimulate local economic development and build local constituencies for conservation. The assumption behind SMEs as a development tool is that with limited public-sector assistance, these businesses can be created and mature into competitive independent entities.

The experience to date of small enterprises in the context of conservation initiatives has been poor (for example, see Appendix 3-B: Case Study of the Maya Biosphere Reserve).

- **First**, established competition often precludes new players from successfully entering the market. An excellent example is found in the case of natural latex production in the Amazon basin. Local latex collectors (rubber-tapers) have long sought opportunities to gain resource management rights in forests rich in natural latex. In the mid-1990s, the Government of Brazil created a series of large-scale "extractive reserves" for the exclusive use of these collectors. Despite access to a free natural resource, price subsidies, and millions of dollars in technical and financial assistance, the collectors have yet to increase their market share. Their competition, national and international latex plantations and industrial processing facilities, produce the same product for a fraction of the cost.
- **Second,** production must occur at a scale that justifies capital investments and captures the efficiencies derived from economies of scale. However, increasing the scale of production may demand a large operation (rather than an SME), and may create the very pressures on the resource that the project hopes to mitigate.

- **Third**, reliability of production and quality control typically tend to be difficult to control within communities that do not have experience responding to the exigencies of markets, especially for export. This factor has plagued many conservation enterprises, especially current attempts to promote wood processing within community-based forestry projects.
- **Fourth,** local technical capacity is typically lacking. While there is a role for public sector technical assistance and capacity building, communities without *any* technical experience may not be self-sufficient within the relatively short time frames of many economic development projects (5 to 10 years).
- **Fifth**, because development assistance must be directed to specific individuals or entities, an equitable process must be conducted to select them. If the target communities lack the organization to participate in this process and make decisions that will be accepted and respected by a healthy majority of its members, social disruption can be readily caused.

Despite the difficulties associated with SMEs in the conservation context, we examined the potential of this development model for NTNR collectors in Bulgaria. Our primary test was the economic potential for SMEs. As indicated in the previous section, the supply chain for NTNRs from the National Parks is well developed, and observations of collectors, buyers, processors, and exporters indicate that excess capacity and competition exists at all levels.

Within this context there may actually be future consolidation in the sector – not a conducive environment for new business. In addition, processors tend to work with a range of products, most at volumes far greater than those collected from the National Parks. The reason is that a constant flow of product is probably required to justify capital investments in processing. Working at higher volumes allows economies of scale, and processing a diversity of products hedges price and supply risks associated with any single product. Therefore, local community SMEs would need to contend with high efficiency requirements, issues of scale, and production diversity, outside the realm of their traditional collection practices. Our general conclusion is that there is very limited economic opportunity associated with berries, herbs, medicinal plants, and mushrooms that can be exploited through SME development in the areas surrounding the parks.

TABLE 3

CONSTRAINTS FOR COLLECTOR COOPERATIVES AND LOCAL SMEs IN BULGARIA'S NATIONAL PARKS

Economic Factor	*Implication for SMEs at Collector Level*
Price competition throughout supply chain	• Collectors probably receive fair-market price for natural resources. • Prices at all points in supply chain generate very low margins. • Attempts by collectors to raise prices is constrained by larger market forces. • Elimination of middlemen will present technical and logistic challenges unfamiliar to collectors.
Substantial installed capacity	• Supply chain can readily absorb all current production – future consolidation within sector is a strong possibility. • Competition already exists to differentiate products and perform value-added processing – niches for SMEs are limited. • Increasing scale allows hedging against single product downturns (supply or price) – i.e. size matters.

1.5. Contracts for Commercial Harvesting

Many countries offer natural resource management commercial contracts (commissions and/or "concessions") for state-owned timber, minerals, fisheries, and NTNRs. Concessions are a means to maximize the economic efficiency of resource use by the private sector, and to facilitate private investment in resource management.

The use of concessions in Bulgaria was examined as a tool for long-term management of NTNRs within National Parks. The present Concession Act covers private management of a wide range of state properties, and has been in place since 1995, with the most recent revisions in January 2001. While NTNRs could be construed as subject to the Concessions Act, the present Act and its conditions are considered inappropriate to a shorter-term time horizon envisioned for piloting a sustainable NTNR model for Bulgarian National Parks.

Instead, this analysis suggests that a more appropriate tool could be the "commissioning" or commercial harvest contract option open to National Parks, under Bulgarian law. Based on a review of regulatory systems in both developing and industrialized economies, it appears that existing NTNR commission or commercial harvest contract system, similar to those in used in North America, and western Europe, could be readily transferable to Bulgaria.

A commission system allows private entities to bid on a competitive basis for the right to manage NTNRs within Bulgaria's National Parks. Harvests of medicinal plants from the commission management areas can be used directly by the commission (contract) holder as an input into processing and export commerce. A commission system is typically easier to regulate because "command-and-control" activities are replaced with "performance-based" supervision, placing the commission holder in charge of determining the most cost-effective solutions for NTNR management that satisfy public sector norms.

Key Elements of a Commission System

An effective commission system should have several key attributes. The commission system must improve the ability of resource managers to ensure the ecological health of the NTNRs and the ecosystems in which they are found. The primary social objective of the commission system is to encourage investment in the local NTNR economy, creating reliable employment opportunities in collection, transportation, processing, and management. At the same time, a commission system should not impede local access of collectors using permits to harvest other areas in national parks.

Commissions should be easy to acquire through a transparent tender process, conducted on a reliable schedule with ample public access to information prior to execution. A commission should be easily enforced and not require significant additional work for park managers. Lastly, the public cost of administering the commission system should be appropriate to the benefits it generates, and in the best case scenario be self-financing.

Improving Ecological Management

Scientific monitoring of resource abundance, impacts from harvest, and regeneration, guide ecological management of NTNRs. Each NTNR has specific requirements for harvest technique, intensity, and timing. Traditional knowledge and harvest practices may be sufficient to guide collectors to avoid damaging the resource, but in many cases regulatory safeguards are prudent. A performance-based commission system for NTNRs in Bulgaria should serve as an effective safeguard from over-harvesting and collateral damages to natural ecosystems in the national parks. Four components should be included in the commission system to accomplish this objective.

1) *Establish ecologically sustainable harvest parameters:* Park managers must complete assessments of the resources, allowable harvest intensities, appropriate harvest timing, and techniques (e.g. harvesting entire plants in order to commercialize only its fruits must be prohibited). The remaining components of the commission system will draw from these parameters.

2) *Establish area of NTNR commission:* Each NTNR commission will be issued for a specific area, known to be rich in NTNRs and in no risk of ecological harm from properly executed commercial harvest. The area must be sufficient in size to warrant a commercial investment in management, and preferably large enough to stimulate investment in local processing capacity.

3) *Establish performance criteria:* Park managers must set ecosystem health norms that must be maintained through management. Some examples include population density of cultivated plants, as well as plants at risk of damage from commercial NTNR collection. In addition, performance criteria should include management norms for site and facility maintenance as well as community rapport.

4) *Require Performance Bonds:* Ecological protection should be enforced through a performance bond, placed at the time a commission is accepted by a private sector entity. The performance bond is an escrow account, equivalent to a portion of the total value of the NTNRs within the concession. The performance bond is returned to the commission holder upon a satisfactory final performance review of their management of the area.

Local Investment and Employment

A major objective of a commission system is to stimulate economic development in communities surrounding Bulgaria's national parks. Although local collectors benefit from the personal collection and commercialization of NTNRs, they typically do not participate in value-added processing of NTNRs. If such opportunities exist, the government of Bulgaria can stimulate investment in local communities by providing secure sources of NTNRs via a commission system in National Parks.

Since it is not possible for the pubic sector to determine *a priori* the profitability of a NTNR commission, a tender is required to maximize the public benefits of granting one. Governments use tenders to capture the market value of natural resources being granted to a bidder. Bidders reveal this value through the auction process. Governments may accept bids in the form of monetary payments as well obligations to invest in resource management or certain sectors of the economy such as value-added natural resource processing. In the case of Bulgaria's national parks, it is appropriate to make local investment and employment plans a selection criterion in the tender.

Local Access

Commissions for NTNR management should not fully exclude access to harvestable resources by local collectors. Harvest areas, to be accessible under a permit system, should be maintained by park managers. In this way, communities will have the choice of participating in employment opportunities offered by commissions, or to continue operating independently.

Ease of Acquisition

Commissions should be issued following a firm timetable and should be transparent in terms of selection criteria and bid evaluation. A prospectus of the NTNR management area (see Appendix 3-C) should be completed and published in a public forum several months before the commission is granted. The prospectus should include a resource evaluation, systemic description of access roads and other infrastructure both in the park and in local communities, performance criteria for management, and weighting of selection criteria. Targeted circulation

of the prospectus should include known commercial operators that process and export NTNRs. Tender application forms should be available at the same time, and accepted by a firm deadline, at least 3 months before the commission is granted. Bid applications should be made available to the public to ensure that selection was conducted fairly.

Enforceability

A primary advantage of a commission system is that is places day-to-day collection management responsibility on the commission holder rather than park managers. This differs from a "command-and-control" system, such as a permit system, in that overall ecosystem health and community relations can be used as performance metrics on which commission holders are judged. In essence, park managers can focus on NTNR management objectives, while the operational means of achieving them are the concern of the private commission holders.

For an effective Commission system, Park managers should conduct three rapid evaluations per year. A preliminary evaluation is required to establish a baseline. In this evaluation, all resources and conditions that will be parameters for performance evaluations must be measured. A second evaluation is required to assess performance at the mid-point of harvest. This evaluation is important to allow park managers to note acute performance shortfalls before harvest is complete, and halt harvests if necessary, or to advise commission holders of shortfalls that can be corrected. The third evaluation is required to assess final performance once harvest is complete. The results of this evaluation will determine whether the performance bond can be released to the commission holder, and whether commission renewal or eligibility for future tenders will be allowed.

Commission holders will assume the majority of NTNR management responsibility, but they should NOT be expected to enforce the laws that protect their commission. Park managers and local law enforcement must be available to stop violations such as illegal harvesting of commission areas by independent NTNR collectors. It is only the responsibility of commission holders to inform park managers or local law enforcement of such violations. If park managers and local law enforcement do not protect commissions, the commission holder must be compensated for losses associated with such violations by third parties, pending presentation of evidence to this effect.

Public Cost

The public cost of a commission system should be low. Required activities include resource assessment, performance evaluations, the production and distribution of materials for a tender, and law enforcement in the case of violations identified by commission holders. It is possible that these costs may be covered by the monetary component of the commission tender. Additionally, some costs of complementary park management functions may be covered as well, such as the individual collection permit system.

Appendix 3-C includes a sample prospectus for NTNR commercial harvest contract/Commission, and a sample application. It also includes an outline of elements of a commercial contract.

TABLE 4

ATTRIBUTES OF INTERVENTIONS

Intervention Option	Resource Impact	Local Economic Benefit	Park Management Requirements
Permit Reform	Improves regulatory control of harvest	Ensures long-term productivity of NTNRs, a valuable resource to local communities Facilitates organic certification of NTNRs	Command-and-control requires park rangers to delimit harvest areas, spot check collection activities Issue permits to collectors (most likely on major roads entering the parks where truck transport occurs). Law enforcement Ecosystem monitoring
Cooperatives/ Associations	None, except in the case where cooperative acquires a concession (see below).	Limited benefits from improved price bargaining or collective investment (see SMEs)	Not applicable
Small/Medium Enterprises	None	Potential benefits from value-added activities performed locally, but existing competition in sector probably too great	Not applicable
Commission System	Improves regulatory control of harvest	Ensures long-term productivity of NTNRs, a valuable resource to local communities Potential to require local investment in capacity-building or processing facilities in local communities Facilitates organic certification of NTNRs	Performance-based system requires periodic audits (use of indicators for ecosystem health, local investment outlined in concession contract) Law enforcement Ecosystem monitoring

2. Recommendations

We draw from our analysis to provide a series of recommendations for an NTNR management model that will ensure long-term productivity of the resource and generate local economic benefits. In particular, improved management of collection activities requires improvements in the permit system and could benefit from the introduction of a concession system. Both interventions serve to maintain current local access to an important economic activity (collection), and could stimulate external investment in the resource.

Observations and reports from the National Park staff and the BCEG Project Team indicate that permitting and enforcement are inadequate to properly manage commercially collected resources. If better control is necessary to ensure that the harvest of NTNRs from the park does not cause ecological harm in the short and long-term, several weaknesses in the current system must be addressed.

Address Current Weaknesses in Permit System

- ***Elimination of permit loopholes**:* All collection should be permitted, regardless of its end use. Permit-free personal collection limits (10 Kg/day in the case of *Vaccinium spp*.) account for the majority of commercial collection. Therefore, there is no motivation to acquire commercial collection permits. Buyers typically pay commercial collection permits anyway, in most cases.

- ***Complexity of acquisition of permits**:* Permits can be simplified so that they require no paperwork. They can be as simple as a stamp or a coupon. Collectors can acquire them at central points of entry into parks during morning hours (collectors should not be allowed to acquire permits *after* collection). The permit should be valid until the resource is collected.

- ***Lack of source control**:* Permits can be color coded to identify the area where collection is allowed. All permits should allow the same volume of collection, consistent with a typical day's collection by one individual (e.g. 10 kg in the case of V*accinium spp*). The number of permits issued controls the overall harvest intensity for a specific area. Enforcement is made easy since rangers can "spot check" collectors inside the park to verify that they have a permit for the area in which they are collecting, or upon exit from the park to ensure volumes do not exceed permit limits. In the case of organic markets, it will also become necessary for exporters to ensure that their product is collected only in those permitted areas with organic certification.

- ***Purpose and Suitability of Permit Fees**:* Since the objective of allowing collection inside the park is to provide local economic benefit, and park management is effectively intended as a subsidy to local collectors, charging fees for permits is counter-productive. Furthermore, the contribution to park budgets from fee collection is insignificant and seems only to generate negative sentiment towards government. If it is determined that fee

collection is desirable, it should be simple to quantify and publish the cost of park administration and the revenues generated from fees that are put towards that cost. This information should be posted at points of permit acquisition as well as be published in the State Gazette.

Institute a System of Commercial Harvest Contracts

A commission system can be developed to complement improved permitting. Commissions can be created for specific areas of the National Parks. These can be offered to bidders that are technically and financially capable of proper resource stewardship. A commission system could address several key issues in NTNR management.

- ***Performance-based collection management***

Commissions can enhance resource stewardship by shifting management from a strict "command-and-control" system to a "performance-based" system. Performance-based systems present norms of ecosystem health to be met in the manner deemed most effective by the resource users themselves. This allows more flexibility, creativity, and theoretically more efficiency in achieving management goals. A commercial harvest contract may include performance norms, with specific indicators that are measured periodically to ensure that the commission holder is practicing good stewardship of the resource.

- ***Stimulate local investment***

A commission tender may include criteria such as technical and financial ability to properly manage a concession, but may also request a proposal for local investment in capacity building or processing. By making investment a competitive criterion for commission acquisition, it is more likely that the best possible investments (in terms of creativity, practicality, and size) will be presented. This may form an important component to local economic benefits accrued from NTNR collectors collecting resources from within the National Parks.

- ***Facilitate organic certification***

Commissions may be able to facilitate supply-chain management necessary for organic certification (see box, Table 5). By explicitly creating accountability for sourcing and resource management, the requirements for organic certification are partially met. If the organic market is accessed, price increases could be enjoyed throughout the supply chain, including local collectors. In addition, some local investments may be necessary to process NTNRs at the collection site to satisfy certification requirements.

Two major issues must be mentioned in the context of improving collection management:

First, both an improved permit system and a concession system will require the cooperation of the forest enterprises, and they must enforce the law equally. Without enforcement, there is no purpose in improving the regulatory system. However, an improved regulatory system can

facilitate enforcement by making it easier to identify violators and by expanding responsibility for good resource stewardship to commission holders. In both cases, we will need to examine the precise deployment needs for park staff.

Second, public information is key to the long-term success of efforts to improve management for the benefit of local communities. An information campaign should include an estimate of the economic benefits accruing to local collectors and their communities, and the activities and costs of park management required to generate these local benefits.

TABLE 5

ATTRIBUTES OF REGULATORY INTERVENTIONS

	Commission	***Permits***
Advantages	Reduces cost to public sector May encourage local investment Performance based Potential for organic certification	Ensures year-round control Potential for organic certification
Disadvantages	Does not ensure year-round control	Enforcement intensive/Command-and-control system
When it works	Mgmt cost < financial benefits Private sector able to manage resource Local communities respect enforcers Enforcement is conducted Local communities respect concession Proper ecological guidelines provided	Local communities respect enforcers Permits are easy to use Based on ecological guidelines Enforcement is conducted
Examples of Performance Indicators	Status of resource after harvest Presence of local investment	Production accounted for by permits Status of resource after harvest

Sources of information gathered between 31 July – 8 August 2001, by international consultant Jared Hardner, are given in Appendix 3-D.

Any additional National Park efforts to support greater public awareness, joint training programs alongside the private sector, and/or the development of campaigns and festivals, are appropriate.

APPENDICES

PART 1

Situation Analysis of the
Status of NTNRs and Bulgarian National Parks -
Opportunities for Collaborative Management

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Characteristics of Non-timber Natural Resources in Rila and Central Balkan National Parks

Table 1. Taxonomy allocation of non timber resources in Rila and Central Balkan National Parks

Taxa	Number for Rila NP	Number for Central Balkan NP	Total number for both parks
Mushrooms (*Mycophyta)*	12	10	18
Lichens (*Lichenes)*	2	2	2
Lycopodiophyta	3	3	3
Equisetum (*Equisetophyta)*	3	3	3
Fern (*Polypodiophyta)*	6	6	6
Gymnospermous (*Pinophyta)*	3	3	3
Magnoliophyta	162	166	166

Table 2. List of economically valuable mushroom species in Rila and Central Balkan National Parks

Taxa	Central Balkan National park	Rila National park	Conservation status
Agaricus sylvaticus		+	
Armillariella mellea	+		+
Boletus aereus	+		
Boletus aestivalis	+		+
Boletus edulis	+	+	+
Boletus pinophyllus		+	+
Cantharellus cibarius	+	+	+
Craterellus cornucopioides	+		+
Hydnum repandum	+	+	
Lactarius deliciosus	+	+	
Lactarius piperitus		+	
Lepista nuda		+	
Macrolepiota procera	+		
Marasmius oreades	+		
Ramaria flava		+	
Sarcodon imbricatus		+	
Suilus luteus		+	
Xerocomus badius		+	+
Total	10	11	8

Table 3. List of medicinal plants in Rila and Central Balkan National Parks

Taxa	Rila NP	Central Balkan NP	Biological type	Reproduction type	Usable part	Conservation status
PARMELIACEAE						
• Cetraria islandica	+	+			T	RU
EQUISETACEAE						
• Equisetum arvense	+	+	p	spores/veg.	Hb	RU
LYCOPODIACEAE						
• Huperzia selago	+	+	p	spores/veg.	Hb	RU
• Lycopodium clavatum	+	+	p	spores/veg.	Hb	RU
ASPIDIACEAE						
• Dryopteris filix-mas	+	+	p	spores/veg.	Fol, Rh	
ASPLENIACEAE						
• Asplenium trichomanes	+	+	p	spores/veg.	Hb	RU
• Phyllitis scolopendrium	+	+	p, d	spores/veg.	Fol	RU
HYPOLEPIDACEAE						
• Pteridium aquillinum	+	+	p	spores/veg.	Fol	
POLYPODIACEAE						
• Polypodium vulgare	+	+	p, d	spores/veg.	Rh	
CUPRESSACEAE						
• Juniperus communis	+	+	h-t	seeds	Fr, Fol	
• Juniperus sibirica	+	+	h	seeds	Fr, Fol	
• Juniperus sabina	+	+	h	seeds	Hb	Pr, RDB
AMARYLLIDACEAE						Pr, RDB,
• Galanthus nivalis	+	+	p, d	seeds/veg.	Hb	Cites
APIACEAE					Rad	
• Angelica pancici	+	+	b-p	Seeds	Rad	RU, RDB
• Angelica sylvestris	+	+	b-p	Seeds	Fr	
• Carum carvi	+	+	b	Seeds	Hb,	
• Eryngium campestre	+	+	b	Seeds	Rad	
• Heracleum sibiricum	+	+	b	Seeds	Rad	
• Sanicula europaea	+	+	p	Seeds	Hb	
ATHYRIACEAE						
• Athyrium filix-femina	+		p	spores/veg.	Fol	
ARACEAE						
• Arum maculatum	+	+	p	seeds/veg.	Tub	
ARALIACEAE						
• Hedera helix	+	+	p	seeds/veg.	Fol	
ARISTOLOCHIACEAE						
• Asarum europaeum	+	+	p	seeds/veg.	Hb	RU
ASTERACEAE						
• Achillea millefolium complex	+	+	p	seeds/veg.	Hb, Fl	
• Arctium lappa	+	+	b	seeds	Rad,	
• Artemisia absinthium	+	+	p	seeds/veg.	Hb	
• Artemisia vulgaris	+		p	seeds/veg.	Hb	
• Carduus acanthoides	+	+	b	seeds	Fl	
• Carlina acanthifolia	+	+	b	seeds	Rad	RU
• Chamomilla recutita	+	+	a	seeds	Fl	
• Cichorium intybus	+	+	p	seeds	Rad	
• Hieracium pilosella	+	+	p	seeds/veg.	Hb	
• Inula helenium	+	+	p	seeds/veg.	Rad	RU
• Onopordon acanthium	+	+	b	seeds	Fl	

Taxa	Rila NP	Central Balkan NP	Biological type	Reproduction type	Usable part	Conservation status
• Petasites hybridus	+	+	p	seeds/veg.	Fol,	
• Solidago virga-aurea	+	+	p	seeds/veg.	Rad	
• Tanacetum vulgare	+	+	p	seeds/veg.	Hb	
• Taraxacum officinale complex	+	+	p	seeds	Fl, Hb	
• Telekia speciosa	+	+	p	seeds	Rad	
• Tussilago farfara	+	+	p	seeds/veg.	Rh	
• Bellis perennis	+	+	p	seeds/veg.	Fd, Fl	
• Anthemis tinctoria	+	+	p	seeds/veg.	Fl	
					Fl	
BETULACEAE					Fl	
• Alnus glutinosa	+	+	t	seeds/veg.	Fl,	
• Betula pendula	+	+	t, d	seeds/veg.	Cort, G	
CORYLACEAE					Fr, Fol,	
• Corylus avellana	+	+	h-t	veg./seeds	Cort	
• Corylus colurna		+	t	seeds	Fr	
BORAGINACEAE						
• Pulmonaria officinalis	+	+	p	seeds/veg.	Fol	
BRASSICACEAE						
• Capsella bursa-pastoris	+	+	a	seeds	Hb	
• Nasturtium officinalis	+	+	p	seeds/veg.	Hb	
• Lepidium ruderale		+				
CAPRIFOLIACEAE					Fr	
• Sambucus ebulus	+	+	p	seeds/veg.	Fr, Fl,	
• Sambucus nigra	+	+	h-t	seeds/veg.	Rad	
• Sambucus racemosus	+	+	h	seeds/veg.	Fr	
• Viburnum opulus	+	+	h-t	seeds	Fr	
CARYOPHYLLACEAE						
• Herniaria glabra	+		a-p	seeds	Hb	
• Saponaria officinalis	+	+	p	seeds/veg.	Rad	
• Stellaria media	+	+	a	seeds	Hb	
CHENOPODIACEAE						
• Chenopodium bonus-henricus	+	+	p	seeds/veg.	Rad	
CONVOLVULACEAE						
• Convolvulus arvensis		+	p	seeds/veg.	Rad	
CORNACEAE						
• Cornus mas	+	+	h-t	seeds/veg.	Fr	
CRASSULACEAE						
• Rhodiola rosea	+	+	p	seeds/veg.	Rad	Pr, RDB
• Sedum acre	+	+	p	seeds/veg.	Hb	RU
• Sedum maximum		+	p	seeds/veg.	Fol	
CUSCUTACEAE						
• Cuscuta europea	+	+	a	seeds	Hb	
DIOSCOREACEAE						
• Tamus communis	+	+	p	seeds/veg.	Rad	
DROSERACEAE						
• Drosera rotundifolia	+	+	p	seeds	Hb	RDB
ERICACEAE						RU, RDB,
• Arctostaphylos uva-ursi	+	+	h, l	seeds/veg.	Fol	Cites
• Vaccinium myrtillus	+	+	h, l	seeds/veg.	Fr, Fol	
• Vaccinium vitis-idaea	+	+	h, l	seeds/veg.	Fr, Fol	
• Vaccinium uliginosum	+	+	h, l	seeds/veg.	Fr	

Taxa	Rila NP	Central Balkan NP	Biological type	Reproduction type	Usable part	Conservation status
FABACEAE						
• Astragalus glycyphyllos	+	+	p	seeds/veg.	Hb	
• Galega officinalis	+		p	seeds/veg.	Hb	
• Genista tinctoria	+	+	h	seeds	Hb	
• Ononis spinosa	+	+	p	seeds	Rad	
• Trifolium pratense	+	+	p	seeds/veg.	Fl	
GENTIANACEAE						
• Centaurium erythraea	+	+	a-b	seeds	Hb	
• Gentiana asclepiadea	+	+	p	seeds/veg.	Hb	
• Gentiana cruciata	+	+	p	seeds/veg.	Hb	
• Gentiana lutea	+	+	p	seeds/veg.	Rad	Pr, RDB
• Gentiana punctata	+	+	p	seeds/veg.	Rad	Pr, RDB
GERANIACEAE						
• Geranium macrorrhizum	+	+	p	seeds/veg.	Hb	
• Geranium sanguineum	+	+	p	seeds/veg.	Rad	
• Geranium robertianum	+	+	b	seeds	Hb	
• Erodium cicutarium		+	a	seeds	Hb	
HYPERICACEAE						
• Hypericum maculatum	+	+	p	seeds/veg.	Hb	
• Hypericum perforatum	+	+	p	seeds/veg.	Hb	
LAMIACEAE					Hb,	
• Betonica officinalis	+	+	p	seeds/veg.	Rad	RU
• Betonica bulgarica	+		p	seeds/veg.	Hb	Pr
• Clinopodium vulgare	+	+	p	seeds/veg.	Hb	
• Galeopsis ladanum		+	a	seeds	Hb	
• Galeopsis speciosa	+		a	seeds	Hb	
• Galeopsis tetrachit	+	+	a	seeds	Hb	
• Leonurus cardiaca	+	+	p	seeds/veg.	Hb	
• Melissa officinalis	+	+	p	seeds/veg.	Fol, Hb	
• Mentha aquatica	+	+	p	seeds/veg.	Hb	
• Mentha spicata complex	+	+	p	seeds/veg.	Hb	
• Origanum vulgare	+	+	p	seeds/veg.	Hb	
• Teucrium chamaedrys	+	+	p-h	seeds/veg.	Hb	
• Thymus sp. diversa	+		h	seeds/veg.	Hb	
• Satureja pilosa		+	h	seeds/veg.	Hb	
LILIACEAE						
• Allium shoenoprasum		+	p	seeds/veg.	Hb	
• Allium ursinum	+	+	p	seeds/veg.	Fol	RU
• Asparagus officinalis	+	+	p	seeds/veg.	Hb	RU
• Colchicum automnale	+	+	p	seeds/veg.	Sem	
• Polygonatum odoratum		+	h	seeds/veg.	Hb	
• Ruscus aculeatus		+	p	seeds/veg.	Rh	RU
• Verathrum lobelianum	+	+	p	seeds/veg.	Rh	
LORANTHACEAE						
• Viscum album		+	h	seeds/veg.	Fol, Hb	
MALVACEAE					Rd,	
• Althaea officinalis	+		p	seeds/veg.	Fol, Fl	
• Malva sylvestris	+	+	a-b	seeds	Fol, Fl	
MENYANTHACEAE						
• Menyanthes trifoliata	+		p	seeds/veg.	Fol	RDB, Pr

Taxa	Rila NP	Central Balkan NP	Biological type	Reproduction type	Usable part	Conservation status
OLEACEAE						
• Fraxinus ornus	+	+	h	seeds	Cort	
• Ligustrum vulgare	+	+	h	seeds	Fr	
ONAGRACEAE						
• Epiobium angustifolium	+	+	p	seeds/veg.	Hb	
ORCHIDACEAE						
• Anacamptis pyramidalis		+	p	seeds/veg.	Tub	
• Orchis species diversa	+	+	p	seeds/veg.	Tub	RU, RDB
PAPAVERACEAE						
• Chelidonium majus	+	+	p	seeds	Hb	
PLANTAGINACEAE						
• Plantago lanceolata	+	+	p	seeds	Fol	
• Plantago major	+	+	p	seeds	Fol	
POLYGALACEAE						
• Polygala major	+	+	p	seeds/veg.	Hb	
POLYGONACEAE						
• Bistorta major	+	+	p	seeds/veg.	Rh	
• Polygonum aviculare	+	+	a	seeds	Hb	
• Rheum rhaponticum	+		p	seeds/veg.	Rad	Pr, RDB
• Rumex alpinus	+	+	p	seeds/veg.	Rad	
• Rumex acetosa	+	+	p	seeds/veg.	Fol	
• Rumex acetosella	+	+	p	seeds/veg.	Hb	
PRIMULACEAE						
• Primula elatior	+	+	p	seeds/veg.	Fl	
• Primula veris	+	+	p	seeds/veg.	Fl, Rad	RU
RANUNCULACEAE						
• Aquilegia vulgaris	+		p	seeds		Pr
• Caltha palustris	+		p	seeds/veg.	Fol	
• Clematis vitalba	+	+	h	seeds/veg.	Fol	
• Helleborus odorus	+	+	p	seeds/veg.	Fol	
• Hepatica nobilis	+	+	p	seeds/veg.	Hb	
• Pulsatilla vernalis	+	+	p	seeds/veg.	Hb	Pr, RDB
ROSACEAE						
• Agrimonia eupatoria	+	+	p	seeds/veg.	Hb	RU
• Alchemilla vulgaris complex	+	+	p	veg.	Hb	Pr, RU,
• Crataegus monogyna		+	h	seeds/veg.	L, Fol, Fr	RDB
• Filipendula ulmaria	+	+	p	seeds/veg.	Hb	
• Filipendula vulgaris	+	+	p	seeds/veg.	Hb	
• Fragaria vesca	+	+	p	seeds/veg.	Fol, Fr	
• Geum coccineum	+	+	p	seeds/veg.	Rh	
• Geum urbanum	+	+	p	seeds/veg.	Rh	
• Laurocerasus officinalis	+	+	h	veg.	Fr, Fol	
• Malus sylvestris	+	+	h	seeds/veg.	Fr	
• Potentilla erecta	+	+	p	seeds/veg.	Hb, Rh	
• Potentilla reptans	+	+	p	seeds/veg.	Hb	
• Prunus spinosa	+	+	h	seeds/veg.	Fr	
• Rosa canina complex		+	h	seeds/veg.	Fr	
• Rubus idaeus	+	+	h	veg.	Fr, Fol	
• Sanguisorba officinalis	+	+	p	seeds/veg.	Hb	
• Sorbus aucuparia	+	+	h-t	seeds	Fr	
• Rubus caesius	+	+	h	seeds/veg.	Fr, Fol	

Taxa	Rila NP	Central Balkan NP	Biological type	Reproduction type	Usable part	Conservation status
RUBIACEAE						
• Galium aparine		+	p	seeds/veg.	Hb	
• Galium odoratum	+	+	p	seeds/veg.	Hb	RU
• Galium verum	+	+	p	seeds/veg.	Hb	
SALICACEAE						
• Populus tremula	+	+	t	seeds/veg.	Cort	
• Salix alba	+	+	t	seeds/veg.	Cort	
• Salix caprea	+	+	h	seeds/veg.	Cort	
SCROPHULARIACEAE						
• Digitalis lanata	+	+	p	seeds/veg.	Fol	
• Euphrasia sp. diversa	+	+	a	seeds	Hb	
• Linaria vulgaris	+	+	p	seeds/veg.	Hb	
• Scrophularia nodosa	+	+	p	seeds/veg.	Rh, Hb	
• Verbascum longifolium	+	+	b	seeds	Fol, Fl	
• Veronica officinalis	+	+	p	seeds/veg.	Hb	
• Veronica chamaedrys	+	+	p	seeds/veg.	Hb	
SOLANACEAE						
• Atropa bella-donna	+	+	p	seeds	Hb, Rd	RU, RDB
• Solanum dulcamara	+	+	p	seeds/veg.	Fol	
TILIACEAE						
• Tilia cordata	+	+	t	seeds/veg.	Fol, Fl	
• Tilia platyphilus		+	t	seeds/veg.	Fol, Fl	
• Tilia tomentosa	+	+	t	seeds/veg.	Fol, Fl	
URTICACEAE					Rh,	
• Urtica dioica	+	+	p	seeds/veg.	Fol, Fr	
• Urtica urens	+	+	a	seeds	Hb	
VALERIANACEAE						
• Valeriana officinalis	+	+	p	seeds/veg.	Rh	RU
VERBENACEAE						
• Verbena officinalis	+	+	p	seeds	Hb	
VIOLACEAE						
• Viola odorata	+	+	p	seeds/veg.	Hb	
• Viola tricolor	+	+	a	seeds	Hb	

Legend

Biological type:
- p – perennial
- h – shrub
- t – tree
- b – biannual
- a – annual
- l – low shrub

Conservation status:
- RU – management regime
- RDB – Red Data Book
- CITES – Convention for the international trade with endangered species
- Pr - protected

Reproduction type:
- veg. – vegetative

Usable part:
- T – thallus
- Hb – herb
- Fol – leave
- Rh, Rad –root system/root
- Fr – fruit
- Tub – tuber
- Fl – blossom
- Cort – cortex

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CO-MANAGEMENT OF NATURAL RESOURCES

This text is aimed at supporting the work of the natural resources co-management pilot project team members. It contains general information about the project, the principles through which it will be applied, the questionnaire for collection and analysis of information, as well as instruction for its application.

Introduction. Context.

A Pilot Project Program is implemented within the Biodiversity and Economic Growth Project, funded by the United States Agency for International Development. The pilot projects are aimed at creating a model for application of the principles of co-management of natural resources in the National Parks. These pilot projects are an aspect of the Management Plan implementation.

The Program comprises pilot projects in the field of natural resource management and use and in the field of ecotourism.

During the preparation for the Management Plan public hearing focus meetings were held with interested institutions and organizations from the park region. The pilot project concept was presented at those meetings, as well as their relation to the envisaged activities from the management plan. The participants had the opportunity to share their first thoughts and ideas concerning the partnership opportunities.

Ideas Presented During the Meetings

PARK OBJECTIVES IN THE FIELD OF NATURAL RESOURCES

- Continuing the collection of natural resources - at a better protection of resources and a better cooperation with collectors
- Participation of local communities in order to support the regulation of the access to some of these resources, the quantity of collected resources, as well as the establishment of stricter regimes and norms for each year. This applies to medicinal plants, mushrooms and wild fruits.
- More efficient law enforcement
- A system for resource monitoring throughout the Park

OBJECTIVES OF THE PILOT PROJECT FROM THE MANAGEMENT PLAN

- Development of more efficient regimes and standards for natural resource management in the pilot areas within the park area together with these groups
- Creation of added/surplus value to the resources collected from areas within the park and adjacent to its boundaries
- Development of local natural resource enterprises and ensuring access to appropriate markets
- Attracting funding and investments for these pilot projects

WHAT IS THE CO-MANAGEMENT OF THESE RESOURCES?

The Rila National Park Directorate is willing to implement this program for Park natural resource protection **together with the local partners.** This program is called 'co-management'

This approach means **agreement for management** of natural resources with the following elements:

- Identifying the associations of local natural resource collectors
- Identifying the populations of significant (from conservation and economical point of view) natural resources
- Determining the area where collectors may work
- Determining the regimes, standards and methods of collection
- Drawing a plan for monitoring of what, when and where is collected
- Determining the responsibilities of the partners – training, advertising, funding, control, supporting the technologies, etc.
- Identifying a method for resolving possibly arising conflicts
- Determining the agreement duration term

Description of the Pilot Program

The program will be implemented at several stages. The first of them is related to the general orientation of the participants from the Directorate, experts, consultants, ARD Project representatives, etc. This stage comprised the meetings held in Bistritsa in December 2000 and in Yakoruda in March 2001, as well as the documentation review and a number of other meetings. The main program implementation teams were appointed. As a result of this stage a decision was taken to conduct the pilot project in the municipalities to the south of Rila National Park. The core team of assistants and consultants, who will work actively during the remaining year and a half, was also identified.

The second stage is related to the collection of information and analysis of the situation. In order to decide what particular actions need to be taken to achieve the necessary success, both for the park and for the local people, it is important that we know in advance what do we have at our disposal, what can we really do together, what assistance do we need. At present the project is exactly at this stage – collection and analysis of information about the existing opportunities in the region.

The third stage is the preparation of the project strategy and action plan – all interested institutions and groups of people that are expected to continue to work together, will participate in it.

The fourth stage is the period of the action plan application.

The fifth stage comprises the results analysis and action plan for the next years.

Instruction for Conducting the Interviews

The goal of the interviews is to gather primary information needed to form the strategy and plan the concrete actions for the implementation of natural resources co-management pilot projects.

(We call 'interview' a meeting, conversation, talk, or whatever you like. We use the word interview by analogy from the sociological surveys, where information is collected in order to analyze a situation, which is what we are going to do. So, in any case it is better not to use this word when you arrange or conduct a meeting.)

Several Golden Rules:

- ✓ Always be friendly and show in any way possible that you like your hosts and you are benevolent to them. This can be achieved by saying simple things like 'How are you', 'We haven't seen each other for a long time', 'It is very nice here with you', by noting something positive, which you have heard lately and that you know will please them ('You had a very nice celebration of…'; 'I heard that you completed your new building…'; or simply 'It is very nice and cozy here' or 'You have a wonderful view out of that window…')

- ✓ Some ideas about the ways for you to lead the conversation are offered further in this text, but if your interlocutor suddenly starts to talk, to 'shower' you with ideas and evaluations, do not interrupt him in no case. Immediately concentrate and start taking notes in order not to miss the answer to some of your questions. The best option for conducting this type of interviews is to ask as little questions as possible.

- ✓ Do not worry whether you have asked all your questions. Do not reach for your list of questions. You should better learn them in advance or write them down briefly in the notebook you will use during the meeting. In short, it is important that you be prepared for each meeting, i.e. that you have thought in advance – who am I going to, what is the particular case, what can I expect from that person and his behavior.

Rules for arranging the interviews.

The meetings shall be arranged in advance on the telephone or personally and the following issues shall be noted:

- It is not appropriate to have more than two meetings per day. The practice explicitly shows that this type of interviews require concentration and attention, as well as sufficient amount of time both for conducting the meeting and for documenting it;
- We ask for a meeting at a time that is convenient to our host;
- If the respective person has attended our meeting in Yakoruda, we note that we would like to continue the conversation started there;
- If the person has not attended the meeting, during the preliminary conversation for arranging the meeting it is enough to say that we would like to meet with him to discuss and to consult with him on the issues of the park natural resources use and the opportunities for cooperation in this direction
- If the person we would like to meet is not the institution's principal – director, mayor, or owner, it is good to consider whether it would be more appropriate to request the meeting through the respective manager – this shall be decided concretely by the people who will carry out the interviews.

Steps for conducting the interviews

We greet the person. If we do not know each other, we introduce ourselves by name. Then, regardless of whether we have met before or not, we specify that we represent the Rila National Park.

- First of all, we announce or remind that recently a public hearing was held of the ten-year Management Plan for the National Park. We note that today's meeting is related to the Management Plan implementation. The Plan envisages activities related to the use of natural resources in the park. The approach of the National Park in this respect is to apply the principles of co-management, which means establishing partnerships with the local people, municipalities, or local companies. The goals is to ensure that local people benefit from the use of natural resources, that it provides opportunities for sustainable means of livelihood for them. The benefit for the park from this approach is that the local people are expected to support the park and contribute to the resources protection, since they will be interested in the profits they can receive every year.
- After this brief introduction you ask whether there are any questions so far and you note that even at this first stage the Park has decided to talk to all interested institutions openly and to consult with them about the ways in which to act next.
- You carefully follow the logic of the conversation as you manage to lead it or as your interlocutor wishes to lead it. Try not to interrupt him, but to ask specifying questions.
- At the end, and if you feel that the conversation is not proceeding easily, even during the conversation, explain to your interlocutor that our wish is to be open in what we start now and that after we summarize the information we shall meet with them again to check whether we have interpreted the situation correctly and whether they agree with our understanding about the situation.
- Thank your interlocutor and invite him to contact or visit you if he remembers of anything else. Leave your contact information.

Contents of the Questionnaire

The questions in the questionnaire are grouped in order to facilitate your work. It is not obligatory to follow the consequence in which they are presented here. Rely on your knowledge and your experience when you have to decide whether or not to ask some of the questions. In particular, you can ask the questions about the job positions, the calmness and other general questions whenever you deem appropriate.

Recording the Answers

Each conversation has to be recorded "registered" by one completed questionnaire form. Use the blank side of the sheets to write down in more detail how did the conversation go and anything that impressed you. On the blank side of the sheet also write down all plant species that we expect to receive information about. Do not forget to ask about quantities and specific locations.

During the conversation, take notes (even brief ones) on everything that your interlocutor shares with you.

Very often at such meetings there is no time to write down notes during the conversation. It is not appropriate to make your interlocutor wait for you to write. Therefore, just mark the answer and listen carefully in order to remember the essence of the answer. That means that immediately after the meeting you have to take the time to write down everything you could not record during the conversation. In the worst case, leave this for the end of the day, but remember that there is a risk that you can mix it whit what you heard during the other meetings.

The most important thing when writing this information down is that you must not try to decide what is important and what is not. Register everything you have been told, so that we can have the information at our disposal whenever we may need it. Sometimes people share things that seem to have nothing to do with the topic of your conversation. Do not hesitate to write down this part of the conversation as well.

This means that for each interview you will submit a completed questionnaire with the respective additions, written on the blank side of the sheet.

QUESTIONS

A. Resources

1. Which medicinal plants, forest fruits and mushrooms occur within the park section:
- name,
- extent of distribution (widespread, of limited distribution, and very rare),
- approximate region, locality and area,
- potential yield of usable parts,
- collectors' interest (significant and collection is carried out in groups or regularly by single collectors).

2. Distance from locations to accessible transport communications and to the nearest permanent purchasing and processing stations.
3. Condition of road network and opportunities for access to locations by collectors or vehicles.
4. Number of issued permits for herbs, fruits and mushrooms – species, regions, restrictions concerning the rules and method of collection. Provide information for the longest possible period since parks declaration and give separately the permits issued by the Park Directorate and those issued by the State Forestry Units prior to the establishment of directorates. It is possible that such information is not kept at the forestry units, but in any case there will be summarized data about the additional uses.
5. Have measures been taken for protection and regeneration of natural locations of endangered medicinal plants, forest fruits and mushrooms prior to and after park declaration.
6. Type of established violations – non-observance of the region specified in the permit, method of collection, lack of permit, collection of non-permitted species.
7. What quantities of the species under special regime are allowed for collection from areas within the current park boundaries – if information is available, specify which companies were given quotas and whether there is information about the actually collected quantities.
8. Have the municipalities and state forestry units undertaken any actions in terms of implementing the Medicinal Plants Act for the preparation of preliminary field assessment in the pre-park zones, which is important to the implementation of business programs of local herb-processors and dealers?
9. Is there data about cases where the municipalities and state forestry units have refused to issue a permit during the last three years and for what reasons?

B. Functional Infrastructure

1. Existing purchasing and processing stations by settlement – who runs the station – a physical or juridical (company, customer cooperation, or other) person, who owns the station equipment.
2. Condition of the equipment and capacity (available evaporation area, number of frames, screening and purifying technique).
3. Existing evaporators – type (type of heater), condition, capacity and operation perspectives.
4. Mechanization of processing – what technology is used, what equipment has been introduces and future intentions for development of the primary processing equipment (reception, evaporation, purifying and packaging). Is there any packing equipment? Are there any blanching facilities?
5. What is the number of permanent collectors (the consistent contingent) and additionally joining collectors.

6. Development of herb, fruit and mushroom collection for the period 1995-2000 – species and quantities of collected herbs, forest fruits and mushrooms by year and for what part of them permits were issued. The most important and the "strongest" ones for the business of each herb- and mushroom-processor.
7. Are there any known violations made in the process of collection and processing, leading to compromising the quality and what are the claims for the produced herbs.
8. Which herbs from the park are of the largest interest from commercial perspective – species and quantities?
9. What are the periods and terms for processing separate types of items by months during the year.
10. Have there been any cases of collection of herbs under restricting regime, species and quantities, and have any conflicts arisen with the control authorities because of these species?
11. Have any new (completely strange, never demanded before, collected many years ago) types of herbs, forest fruits and mushrooms been introduced?
12. What portion of the processed production is designated for export, for the internal market or for both destinations. Volume of commercial batches – small quantities or large quantities for one truck. How many and who are the main commercial partners, provided this is not a corporate secret? What is the pricing policy and pricing practice – how is the price formed.
13. Length of service in the field of herb and mushroom processing and how was the production experience gained – family business or the experience is gained independently or through attending specialized courses.

C. Alternatives

1. Herb cultivation in the region – what crops were or are grown at the moment – species, perennial or annual plantations, areas, method of land use (own land, rented or leased), what is the organization – family principle or through hiring workers, what type of land is used in terms of agricultural land categories, planting material – procurement sources, has high-quality material of Bulgarian and foreign origin been planted.
2. What are the main problems in the organization of cultivation and the marketing of collected herbs. Preferred crops and means needed to create plantations. Need for technical assistance – technological directions and plant protection activities.
3. Is there a positive attitude towards cultivation of medicinal plants among the population in the region and what are the main disappointments up to now – by the lack of production experience, by the dealers and the offered prices and contractual conditions, by the choice of a crop that is not appropriate for the natural and climatic conditions in the region.

D. The Way to the Market

1. Are there companies (local or external) in the region that process herbs, forest fruit or mushrooms and what do they produce. How long have they been operating?
2. What quality requirements are observed – by contract, regular trade quality by the Bulgarian standards – disappointments because of abuse by the exporters or through your fault.
3. Where are the commercial batches formed – at the station, jointly by neighboring stations or at the central stores of large companies?

E. General Questions about the Settlement and the Region

1. Number of residents in the settlement? How many families/households are there?
2. Is there a school, cultural center, where do the children study, what is the occupation of young people?
3. What is the main means of livelihood in the settlement – in the near past and now?
4. Are there prominent persons in the settlement – formal or informal leaders. Can we rely upon their support?
5. Are there any severe conflicts or negative trends that can affect or discredit the success of the project – hostility, jealousy of groups with economic interest, political or ethnical problems or anything else?

F. Recommendations for the Future Work

1. Do you think that there is anything that can actually be done to increase the standard of living of local population based upon the use of natural resources?
2. What opportunities seem realistic to you?
3. With whom and how would it be appropriate to start working?
4. The resolution of which problem would "trigger" success?

List of Companies Dealing with Export of Herbs

Company	*Address*	*Contact Numbers*
Agro Trade	63, Patriarh Evtimii Blvd, Sofia 1463	Tel. 951 5828, Fax 951 6159
Ahat-5	70, L. Karavelov Str., Sofia 1142	tel.: 65 83 00, fax: 65 02 57, telex: 24 996 AHAT BG.
Andi 13	91, Arsenalski Blvd, Sofia1421	Tel. 00359 2 62 13 98 Fax 00359 2 68 80 36
Bilex-Mitrev	Mramor District, Vrubnitsa Sofia 1761	tel. 9251154, 088 517522
Bioprograma	Dobroslavtsi 1247 Novi Iskar	tel. 58 11 22, 936 07 50 fax: 0799 69004
Bultrade - L. Tonev Co.		tel. 20 99 37
Da Da Da	Mladost 1, bl. 48, entr. 3, ap. 34	tel.741 333
Fruktimpex / Bulgarplodexport	7, Saborna Str., Sofia 1000	tel./fax: 987 4853, 87 03 55 telex: 23 297
Iabakio	78, Rakovski Str., Sofia 1000	tel. 359/2 803 638; 875 270; 815328, 981 9214; 981 9612 fax: 359/2 988 5810; 447372 telex:25 162, E-mail: iabakio@main.infotel.bg.
Kamea	50, Bulgaria Blvd, Plovdiv 4003	tel. 032/650 161 fax: 032/650 160
Kralex	Sofia 1000	tel./fax: 9808568, 981 6533 telex: 23 963 kralex bg
Litexport	10, Banat Str., Sofia 1407	tel. 624 954, 686 150, 9625 013, 684 044 fax: 689 259, 689 481 telex: 22 140 Litex BG
Planta Fruct Export	1, Milko Bichev Str., ap. 4, Sofia	tel. 465 331, 464 067
Plantarion	21, Kaliakra Str., Shumen	tel. 054 6464598
Trakia Export	19, Skobelev Blvd, Sofia 1463	951 66 55, 951 62
Tsvetan Mitev	1, Kresna Str., Sofia 1233	tel. 02/ 31 74 26 fax: 02/74 96 11 telex: 25490 mitev bg.
Vitafrukt	27, Dondukov Blvd, Sofia 1000	tel. 804 276 tel./ fax 803 842, telex 24560 Vita
Yugoplod	Southern Industrial Zone 2 Haskovo	tel. /038/2 01 00, 2 50 15 fax:2 25 23, telex: 43512.

APPENDICES

PART 2

Vaccinium spp. Resources Assessment
in the Pilot Areas

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Development of Maps for Vaccinium spp. Resource Assessment Application of Geographic Information System (GIS)

One of the objectives of the resource assessment was to study the distribution of the *Vaccinium spp.* resources and to map the economically valuable localities of bilberries (*Vaccinium myrtillus* L.) and cowberries *(Vac. vitis-idaea* L.) in the National Parks pilot regions.

Map sheets (scale 1:25000) were prepared with the help of the GIS databases for the two parks, for the purposes of this assessment. Each park pilot area used 8 map sheets. These covered the territory of Park Section Klisura for Central Balkan National Park, and Park Section Yakoruda and Belitsa for Rila National Park. Map sheets included the national grid and nomenclature for the cited scale, in coordinate system "1970". To facilitate the specific mapping of the economically important localities in the field, we used 1 km grid.

The boundaries of the investigated localities were drawn by hand on the maps during the fieldwork conducted in August of 2001. The preparation of maps for the *Vaccinium spp*. resources assessment was the first practical application of GIS for the two National Parks in support of management plan implementation.

Klisura Park Section– Central Balkan National Park

The information in the compendium High Mountain Treeless Zone of Central Balkan National Park, published by the *Bulgarian Swiss Biodiversity Conservation Program,* and the digital maps included in its Atlas of Vegetation (Meshinev et al. 2000), for the same territory, were used as a base line data on the distribution of *Vaccinium spp*. in Klisura Park Section.

The Resource Assessment Team Leaders selected all vegetation associations with *Vaccinium spp*, using the information from the compendium. We did not take into consideration the percentage projective cover of *Vaccinium spp*. Since the digital maps included in the "Atlas of Vegetation" only represent vegetation units at the level of plant formation, we used these digital models and these vegetation classification units as the basis for map preparation used in this resource assessment.

The plant formations, including *Vaccinium* spp. were classified in three groups on the basis of the degree of *Vaccinium* plants projective cover in the relevant associations:

Group 1. Formations with projective cover of *Vaccinium spp*. 15-25% - includes formations with following numbers from the compendium:

No 3 – *Agrostis rupestris* formation
No 7 – *Potentilla haynaldiana* formation
No 8 – *Poa media* formation
No 32 – *Festuca rubra* formation
No 33 – *Agrostis capillaris* formation

Group 2. Formations with projective cover of *Vaccinium spp*. over 25% (regardless of the upper limit of the *Vaccinium spp*. projective cover) - includes formations with following numbers from the compendium:

No 4 – *Festuca airoides* formation
No 5 – *Sesleria comosa* formation
No 6 – *Avenula versicolor* formation
No 12 – *Festuca balcanica* formation
No 15 – *Carex kitaibeliana* formation
No 18 – *Lerchenfeldia flexuosa* formation
No 19 – *Bellardiochloa violacea* formation
No 21 – *Nardus stricta* formation
No 22 – *Calamagrostis arundinacea* formation
No 31 – *Luzula luzuloides* formation
No 52 – *Bruckenthalia spiculifolia* formation

Group 3. Formations of *Vaccinium uliginosum, V. myrtillus,* and *Juniperus sibirica* (irrespective the projective cover) – formations with numbers 47, 51, and 49-50 in the compendium. These are the vegetation units, where the two *Vaccinium* species are dominant or co-dominant plant species and play major role in the plant community.

There was only minor overlap on the border areas of the high mountain treeless zone and the populations of V*accinium spp*. with the forest communities.

From the vegetation layer of the GIS, the polygons representing the plant formations of interest were extracted and reclassified into 3 groups, as illustrated above. Each of the 3 groups was treated as a separate map unit combining sets of polygons representing their respective plant formations. On the map sheets we produced, each group was marked with a different color and the polygons falling into it were numbered with the corresponding number of the plant formations.

The data layer representing the 3 categories was subsequently overlaid on the topographic base map of the park section, with the help of GIS. The topographic base map shows the park, park section and reserves boundaries, hydrology network, transport network and infrastructure, types of forests and the boundaries between them, contour lines (every 200m) as well as rock formations locations.

Yakoruda and Belitsa Park Sections

No digitized vegetation maps (apart from forest fund inventory maps) were available for the territories of Yakoruda and Belitsa Park Sections of Rila National Park. We were aware however, that the most populations of *Vaccinium spp*. are distributed mainly in forest communities of Scots pine (*Pinus sylvestris)*, and Macedonian pine (*Pinus peuce)* and, to a lesser degree, communities of spruce, (*Picea abies).* To aid identification of possible concentrations of the berries, we used the forest fund inventory maps of the local forestry enterprises. For the purpose of the current assessment, we drew on Park topographic maps both the contours of the territory of forest units and their sub-units. The topographic base maps have the same general characteristics as the ones described for Klisura Park Section. In the case of Yakoruda and Belitsa PS, the layer with boundaries of different types of forest was replaced with the layer representing the boundaries of forest units and sub-units from the forest fund inventory.

In addition, the attribute data from the inventory of the forest fund of the former state forestry units Yakoruda, Belitsa, and Razlog were extracted from the National Park database when they described forest units and sub-units that fell into the area of the two relevant Park Sections. The forest inventory data (1990) served as an additional source of information for the localization and descriptions of the control areas, and the localities as a whole.

APPENDICES

PART 3

Economic Growth and Management Options

Organic Certification Contact Information

Organization	*Description*	*Contact Information*
IFOAM	Oversight Body	IFOAM c/o Ökozentrum Imsbach D-66636 Tholey-Theley Germany Tel: +49 - 6853 9198 90 Fax: +49 - 6853 9198 99 Email: HeadOffice@ifoam.org Web: www.ifoam.org
ECOCERT International	Certification agent	Iris Förster ECOCERT International Förster Str. 87 D - 37520 Osterode Germany Tel: +49 - 5522 9530 93 Fax: +49 - 5522 9511 64 Email: iris.foerster@ecocert.de Web: www.ecocert.com
Naturland e.V.	Certification agent	Alexander Koch Naturland e.V. International Section Kleinhaderner Weg 1 D - 82166 Gräfelfing Germany Tel: +49 - 8989 8082 87 Fax: +49 - 8989 8082 90 Email: a.koch@naturland.de Web: www.naturland.de
Skal	Certification agent	Skal P.O. Box 384 NL-8000 AJ Zwolle The Netherlands Tel: +31 - 38 422 6866 Fax: +31 - 38 421 3063 Email: info@skal.com

Case Study of the Maya Biosphere Reserve[1]

Biosphere Reserves integrate economic activity directly into conservation management, and in some cases involve concession systems. In 1990, the Government of Guatemala created the Maya Biosphere Reserve (MBR), an area that spans 2.1 million hectares of tropical forest (nearly 15 percent of the country's landmass). The MBR is zoned into three major land use areas.

- Core Zones – where forest protection is most strict and only benign activities are permitted such as ecotourism and scientific research.
- Multiple-Use Zone (MUZ) – the largest portion of the Reserve, where extractive activities are permitted, including logging and the harvest of NTNRs that follow government approved management plans. Human settlements are also permitted in clearly defined "community management units."
- Buffer Zone – a 15-kilometer swath of land bounding the southern border of the MUZ and Core Zones where agricultural and other land use activities are permitted and private property can be acquired.

Concessions serve to organize economic activities in the MUZ and ensure that they conform to management plan objectives for the Biosphere Reserve. They have transformed the forest from an effectively open-access resource to one that is carefully managed and supervised. There are 14 concessions granted to local communities and two granted to industrial firms, each for 25 years, covering an area of approximately 500,000 hectares. Concessions are intended to generate financial returns to concession holders, stimulate local economic development, and create local constituencies for the Maya Biosphere Reserve.

Since the formation of the Maya Biosphere Reserve, the conservation outcome has been positive; forest conversion to agriculture and pasture outside the reserve is ubiquitous, while forest cover remains across most of the reserve. By most accounts this can be explained by the presence of community concessions within the reserve and the sense of ownership and accountability they create for the forest resources. The economic outcomes have also been favorable to the extent that the resource base has maintained its productivity under concession management, and communities have gained assured access to the resources.

However, over the course of the Maya Biosphere's history, communities have been provided a substantial injection of funding from USAID and other sources of international aid to organize production (e.g. acquire concessions, design management plans) and to develop small enterprises to collect and process NTNRs and timber. In retrospect, these investments assisted greatly in building the organizational capacity of communities, but it placed too great an emphasis on the natural resource's ability to stimulate long-term economic development.

[1] This case study is based on a detailed report by Jared Hardner and Sharon Flynn written in 2000 and to be presented to USAID and other project donors and implementers in November, 2001.

In reality, unprocessed NTNRs offer prices that are steadily declining in real terms (over the last ten years, annual real price appreciation for NTNRs has been between 0 and –10 percent). Value-added processing, the ultimate goal of small enterprise development, has proven to demand far greater technical and organizational capacity than the majority of communities have gained over the last 11 years of external assistance. Most communities are unable to meet market demands for quality, unable to compete on price, unable to reliably deliver supply to clients willing to invest in the communities' long-term prospects as providers of "ecological" or "green" products, and unable to administer small businesses without assistance from NGOs. Activities, ranging from cooperatives to collect and process decorative forest plants for export (*xate*), to small portable sawmills have been tried. To date, only one community concession has developed sufficient capacity to run a self-sustaining business. In many cases, the only source of revenue from concessions comes from sub-contracting industrial loggers to remove and process timber from their forest concessions. By most accounts, the experience of small conservation enterprise development has been unproductive, and very costly.

There are a couple of key lessons learned from the experience in Guatemala.

First, resource use concessions can make a substantial contribution to conservation management if concession holders are held responsible for the condition of resources. Despite economic disappointments, concessions holders have been effective in managing their forests with conservation objectives in mind.

Second, while local economic development and constituency building are critical, there may be means to accomplish these objectives without placing unwarranted confidence in the ability of local communities to become competitive economic players, even with intensive external assistance. Project donors may have created a long-term dependency for foreign aid, rather than sustainable small enterprise development – at a cost potentially greater than the net present value of concession returns to communities over the long run. Addressing this concern, international donors are considering the possibility of simply paying communities to provide conservation management rather than continue to develop small enterprises.

Sample Prospectus for NTNR Management Commissions

Document Identification

Prospectus for Medicinal Plants Commission
Issuing Agency: _____
Issue Date: _____
Additional Information Contact: _____

Resources Available, Description of Location, and Term

Commission Size (ha): _____
Commission Location: _____
Maximum Period of Commission (yrs): _____

NON-TIMBER NATURAL RESOURCES UNDER COMMISSION		
Product	**Volume per ha**	**Estimated Value per Kg**
Product 1	*X* Kg/ha	*A* leva/Kg
Product 1	*Y* Kg/ha	*B* leva/Kg
Product 1	*Z* Kg/ha	*C* leva/Kg

Production Infrastructure

Description of roads that access commission area: _____
_____
_____
_____
_____
_____

Description of energy and water available in and around commission area: _____
_____
_____
_____
_____
_____

Commission Selection Criteria

The commission will be awarded to a single applicant, based on evaluation of several criteria.

COMMISSION SELECTION CRITERIA	
Criterion	**Evaluation Weight**
Proposed Commission Payment	20%
Proposed Local Investment Plan	30%
Proposed Local Employment	30%
Business Experience	20%
Medicinal Plant Management Experience	20%

Commission Performance Criteria

The commission will be monitored to ensure proper management. Failure to maintain adequate levels of performance will result in either: a) official requests to modify management practices; b) revocation of commission; or, c) loss of performance bonds. The modalities of commission performance will be specified in the commission contract. Applicants should be aware that they must be prepared to manage the commission area to achieve the performance criteria stated below.

COMMISSION PERFORMANCE CRITERIA	
Criterion	**Minimum Performance**
Local Employment	75% of *Proposed* Local Employment
Local Investment	75% of *Proposed* Local Investment
Criterion 3	*X* Units
Criterion 4	*Y* Units
Criterion 5	*Z* Units

Map

[INSERT MAP OF AREA AS FINAL PAGE]

NTNR Management Commission Tender Application

Document Identification

Application for Medicinal Plants Commission
Issuing Agency: _____
Issue Date: _____
Additional Information Contact: _____

Rules for Entering Tender

1) Tender will be executed on _____. All completed applications must be received three (3) business days prior to this date, at the address of _____.
2) The applicant must establish that it has legal authority to operate a business in Bulgaria, and attach a copy of identification demonstrating its legal location.
3) Applications must be accompanied by a check for one-twentieth (1/20) of the full monetary equivalent of the bid proposed in the application (payment + investment + employment). This amount will be either: a) returned to the applicant upon NOT receiving the commission; b) put towards the performance bond for the commission, calculated at one-tenth (1/10) of the full monetary equivalent of the bid proposed in the application (payment + investment + employment); or c) kept by the Issuing Agency in the event that the applicant wins the commission, but does not accept it.
4) The commission will be granted within twenty (20) business days of the tender, and the commission winner will be allowed to commence operations immediately upon signing a commission contract with the Issuing Agency.
5) All applications will be made available to the public for review after the commission is awarded.

Identification of Applicant

Name of Applicant: _____
Address of Applicant: _____
Attached Proof of License to Operate in Bulgaria: _____
Attached Proof of Address: _____

Description of Business Experience: _____
_____
_____
_____
_____
_____

Description of Medicinal Plants Management Experience: _____
_____
_____
_____
_____
_____

Resources Requested for Management

NON-TIMBER NATURAL RESOURCES REQUESTED	
Product	**Estimated Volume of Harvest**
Product 1	*X* Kg/ha
Product 2	*Y* Kg/ha
Product 3	*Z* Kg/ha

Commission Bid

Description of Local Employment Proposal: _____
_____
_____
_____
_____
_____
_____
_____
_____

Description of Local Investment Proposal: _____
_____
_____
_____
_____
_____
_____
_____
_____

Proposed Annual Payment for Commission: _____

Proposed Period of Commission (yrs): _____

Acknowledgement of Terms

The applicant acknowledges the following rights and obligations that accompany this application:

1) The applicant must accept the commission if it is granted. In the event that the applicant fails to accept the commission, the Application Fee will not be returned to the applicant.
2) The applicant must sign a Commission Contract to commence operations.
3) The applicant must post a Performance Bond equivalent to one-tenth (1/10) of the total monetary value of the commission bid (payment + investment + employment - Application Fee) upon signing a Commission Contract.
4) The applicant must implement the proposed plans, as described in this application, if the applicant wins the commission. Satisfactory implementation will be based upon performance criteria set forth in the Prospectus, and evaluated according to the modalities set forth in the Commission Contract. In the event that the applicant fails to satisfy these criteria, the performance bond may not be returned to the applicant.
5) The Commission Contract is available to the public and should be reviewed pior to submitting this application.
6) An application fee of _____ is attached to this application.

Date:_____

Signature: _____

Title: _____

Company: _____

Sample NTNR Management Commission Contract

[To be drafted with Bulgarian Lawyer, should include key elements]

Identification of document

Resources Under Commission

Payment and Investment Agreement

Performance Criteria for Management/Modalities for Evaluation

Performance Bond

Enforcement Rights and Responsibilities

Exit Terms

Map